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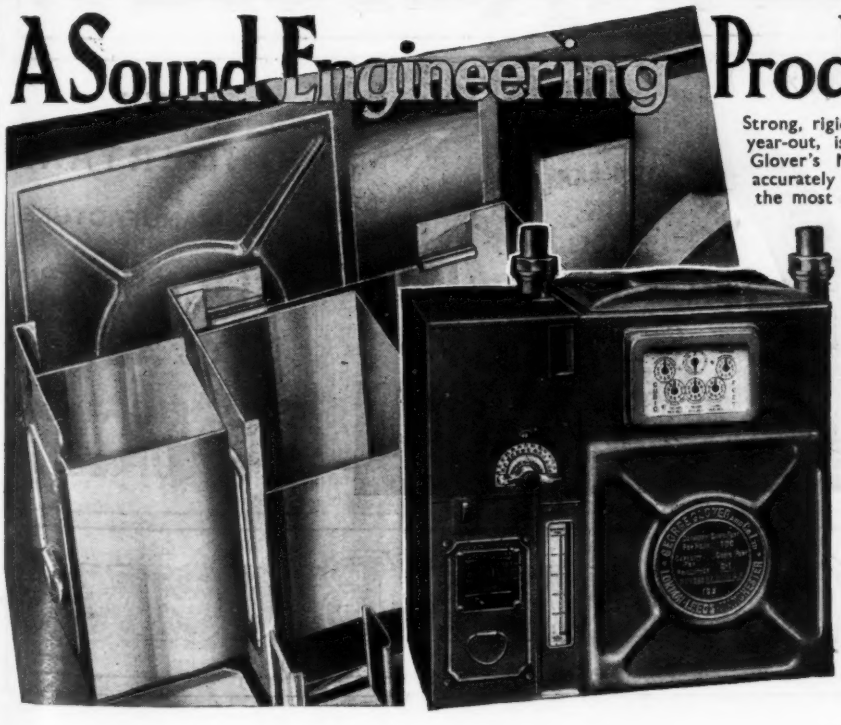

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Gas Journal

AUGUST 21, 1935

Vol. 211. 87th Year No. 3770

Editorial Notes

Gas in Ireland

In last week's "JOURNAL" we published the Presidential Address of Mr. J. A. Rooney which he delivered at the Annual Meeting of the Irish Association of Gas Managers, held in Dublin. On other pages to-day will be found the Paper by Mr. D. A. Pratt, who discusses the future of gas in Ireland. The other contributions were by Mr. P. C. Booth, who dealt with the care and maintenance of gasholders—a question which is assuming more and more importance—and by Mr. J. P. Morrison, on refrigeration. These contributions will be published in the "JOURNAL" later.

Mr. Rooney gives a striking picture of the difficulties which face small and isolated gas undertakings in Ireland, particularly those in the Free State. The difficulties are, of course, many, but in its long history the Gas Industry has had to face many difficulties, and we think that if the situation is tackled firmly and in a spirit of faith in the future of gas, troubles will be overcome. One of the handicaps—and perhaps the greatest—lies in the purchase of coal, gas undertakings having to pay the substantial duty of 5s. per ton besides being restricted to a quota, whereas transport and other industries where coal is an essential of the manufacturing process are obtaining their coal supplies free of tax. In this we have a typical instance of the unfair treatment meted out to the Gas Industry in comparison with its competitor electricity.

Then there is, we are told, what amounts to indifference to the future prosperity and expansion of the Gas Industry in Ireland on the part of some of those who are deciding the policies of gas undertakings. This applies, says Mr. Pratt, to both committee men and directors. Unless they themselves really believe that gas and the products which accompany its manufacture are destined to serve the community to a greater degree than at present, progress obviously will not be made. Indeed, without such belief, retrogression is certain. Time and again we have emphasized that the Gas Industry should be gas conscious throughout, that its personnel from humblest to highest should be gas minded, and transmit their enthusiasm to gas consumers and the public generally. There are so many opportunities of doing this, and so many platforms, but up to the present at any rate full use has not been made of the opportunities which exist. And in this regard small undertakings are perhaps even more advantageously placed than the larger ones, in that they can exercise closer personal contact.

It appears to us that some small gas undertakings do not fully appreciate developments which have taken place during recent years, and which especially apply to them. Again, we doubt whether there is general recognition of the fact that the small undertaking makes in addition to gas valuable by-products which, if properly prepared and marketed, could result in cheaper gas. For this reason we note with lively satisfaction Mr. Rooney's comments in this regard. We quote his words:

"The time was when our principal preoccupation was the extraction of the maximum number of cubic feet of gas from coal by the process of carbonization. We are still concerned to secure the maximum yield from the coal we carbonize, but now we think in terms of the products from the coal and not from gas alone. Coke, tar, and in some cases benzole, now enter into the economics of gas manufacture to a greater extent than ever before, and the gas manager takes as his criterion of efficiency not simply the make of gas per ton, but the salable yield of products from each ton of coal."

We wish that all those in charge of gas undertakings fully appreciated the significance of this essential viewpoint.

The Small Works

As we have said, much has been done for the small gas-works by the manufacturers of plant. As an instance we have the small, trouble-free, automatically operated water gas plant. Again, coke screening plant is available to the small works, and every installation has shown it to be a paying proposition. Moreover, it pays not only from the immediate revenue point of view, but also in impressing upon the public the quality of service which their local gas undertaking is prepared to give. Then there is the question of carbonizing plant control, and greater attention to this aspect of gas manufacture would again prove a paying proposition. Turning to the selling side, there is nothing to prevent small undertakings from introducing methods of charge more attractive than the obsolete flat rate. We are of opinion that wise expenditure and courageous selling policy would quite transform the outlook of some of the small Irish gas undertakings which are feeling the force of unfair competition. There is another point, and it is one of many mentioned by Mr.

Pratt in a paper full of pertinent suggestion, and that is the great potentialities for the use of gas for industrial purposes and applications other than domestic in every area of gas supply, provided reasonable prices are quoted for the additional load. There must be many small undertakings which have available plant of a capacity considerably in excess of its present output, and which could obtain this additional business. This, in turn, by lowering overhead charges, would make available to the domestic consumer gas at more attractive prices.

The Presidential Address and the Papers presented at the meeting in Dublin last week certainly gave members of the Irish Association something to think about. We may mention here a few of the suggestions put forward. On the question of tar distillation, the President advocated co-operation—that the small undertakings should get together with a view to establishing central tar works to which they would send their products for treatment. This idea is well worth considering, for to-day the requirements of surveyors in respect of tar for road making and surfacing are, rightly, very exacting. In most cases these requirements can be met far better at a central tar treatment works than by very small undertakings working individually, and the economies of large-scale working and the benefits of technical control are apparent.

Mr. Pratt is of opinion that, in general, gas undertakings do not impress upon the public as they ought to do the value of the service they are offering. While, of course, it is desirable to supply gas cheaply, cheapness is only one factor in gas service. The idea at the back of our minds should be quality of service, value for money. Mr. Pratt is convinced, and we share his view, that even the smallest works requires some sort of showroom. There is no need for anything elaborate, but a great deal can be done for quite a small expenditure. The point is we must display the appliances we offer, and not expect the public to come round to the gas-works to enquire as to what developments are taking place in the design of gas appliances or about new applications of gas. Those small undertakings without showrooms would do well to bear in mind Mr. Pratt's statement that he knows of no works having a good showroom receiving proper attention which has been forced to close down, and Mr. Pratt has been brought into contact with the conditions of the Gas Industry in Ireland over a long period of years.

Modern Heating by Coke

Reliability, automatic operation and control, cleanliness, and silence constituted the requirements demanded of the boiler plant which was to be made responsible for the whole of the hot water supply and central heating for a new and large block of " luxury " flats at Putney. That gravity feed coke boilers were selected as being the most suitable equipment for this exacting task is no small tribute to the degree of perfection to which these boilers have been brought and to the close attention to grading and screening which renders our chief by-product so admirable a fuel for the purpose. When tenants of flats pay a rent which is stated to include a continuous supply of hot water, together with adequate central heating during the winter months, they are entitled to expect such service to the letter. The plant selected for these services, therefore, must not be liable to sudden and unexpected stoppages, or require a great deal of attention as regards either cleaning or control, or create any nuisance to the surrounding property by way of noise, smuts, or dust. At the same time, it must be an economic proposition, and the regular supply of fuel must be ensured. That the plant described on later pages of this issue has fulfilled these requirements is clear, and that a section of it has directly displaced oil-fired equipment is cause for no little gratification.

The degree of automatic control which can be applie to this type of plant is a great point in its favour, an the fact that gas-works coke is an excellent fuel for suc trouble-free operation is one which cannot be made to widely known. The Manor Fields Estate at Putney con prises over two hundred flats, and the boiler house w have chosen to describe is the largest of three, servin no fewer than 96 flats. Six gravity feed boilers, spic and span with their chromium-plated fittings, undertak the combined duties of hot water supply and central heat ing. The former service operates on the indirect prin ciple, with storage calorifiers, and a small pump to en sure that the water at a steady temperature of 140° F is immediately obtainable even at the furthest draw-of tap without that annoying preliminary of first running off a gallon or so of cold. During periods of heavy de mand for hot water another pump is utilized to accele ate the primary circuit and thus maintain the tempera ture in the calorifiers. Adequate pipe lagging results i a loss of less than 5° in transit, while the latest type o thermostatic control, with safety cut-outs, assists th automatic operation of the plant, which it is estimate will provide the dual service at a cost of 4½d. per flat pe diem.

But one of the most noticeable points in regard to th plant is the spotless cleanliness of the boiler house wit its 19-ton storage hopper above the neat line of boilers Coloured pipes to distinguish the various circuits add t the general brightness of the interior, and apart from the occasional sound of gently falling coke within the boiler and the just perceptible hum of the little electric pump the whole plant is noiseless, while it is needless to say that nothing appears to be issuing from the adjacent chimney which serves to carry away the waste gases.

As a whole this is a most interesting installation which should do much to enhance the prestige of coke for large-scale work of this nature; and the London and Counties Coke Association, who co-operated with the Wandsworth and District Gas Company in the design of the plant, have done good service to the Industry.

Helping the Motorist

In a communication to the North-Western Branch of the Illuminating Engineering Society a few months ago [" Journal," April 17, p. 154], Mr. C. A. Masterman stated that he had analyzed a table contained in a Ministry of Transport report on fatal road accidents in 1933 with a view to seeing whether there could be found in it an indication of the effect of street lighting upon the accident rate. From this analysis he concluded a very definite relation between street accidents and street lighting, and he said it would seem that the provision of some form of lighting on the average decreases the probability of accident by about one-half. A sufficiency of lighting should be provided on roads carrying any considerable degree of traffic to encourage the driver to travel without headlights.

This last point is emphasized also by Mr. James T. Skinner, writing in the *Financial Times* from the point of view of the motorist, when he says that in the next few years, if motor traffic continues to increase at the present rate, something will have to be done to make headlights entirely unnecessary in populous areas. At the present time, " thousands of miles of important routes, in built-up areas, and carrying a high density of traffic, are illuminated by such antiquated methods that powerful lights on vehicles are essential if reasonably rapid and comfortable progress is to be made." While admitting that many good systems of lighting are in nightly use up and down the country, this writer is of opinion that, until something is done to bring the street lighting of the whole country under a more centralized form of control,

the present dangers must continue; and he adds significantly that "the Road Fund exists to enable the central executive to help local authorities to put national traffic routes in their areas into safe condition." What Mr. Skinner has to say in his article strongly supports the contention of Mr. Masterman that an item of public service representing so great an expenditure of money as does street lighting deserves considerably more attention than it has received in the past. Meanwhile, all concerned—and who is not, either as motorist or pedestrian?—will derive satisfaction from recalling to mind the fact that a Committee of the Ministry of Transport is at present engaged in reviewing the subject of street lighting in the broadest possible sense.

Correspondence

The Five-Day Week

SIR,—I have been directed by the Gas Officers' Association, which is a section of this Union, to express to you their thanks for your Editorial Note concerning the five-day week, which appeared in your issue of July 24.

The members of the Association are satisfied that the advantages accruing from the application of the shorter working week, to both employers and employed, far outweigh the disadvantages. Before the large firm of wholesale druggists and manufacturing chemists, to whom you referred, decided to test the effect on output of compressing the working week into 42½ hours spread over five days, officials of this Union were consulted in regard thereto.

It was therefore very gratifying to the Executive of the Union to learn at the end of the six months' experimental period that output showed an increase, as in such circumstances no question of reducing wages was likely to arise.

It is the hope of the members of the Association that the gas undertakings of this country will give the question their serious consideration so that the benefits to be derived by all concerned in the Industry may be enjoyed without any longer delay than is absolutely necessary.

Yours, &c.,
JOHN M. ALLEN,
Divisional Officer.

National Amalgamated Union of Shop Assistants, Warehousemen, and Clerks,
46, Victoria Street, S.W. 1,
Aug. 13, 1935.

Solid Smokeless Fuel

SIR,—Your Editorial on this subject in the "JOURNAL" for Aug. 7 illustrates as never before the wisdom behind that great truism: "Many a false step is made by standing still." Rightly, or wrongly, from the viewpoint of national economy, the day has dawned for low-temperature solid smokeless fuel; hence we who are within the Gas Industry should acquiesce with Shakespeare's Macbeth:

> "Things without all remedy
> Should be without regard.
> What's done, is done."

Thus we clarify our outlook, and fall more easily into step with the reality, that henceforth the market contains both high and low temperature solid smokeless fuels. Our present problem is simplified to the one burning question at issue: Shall we, as an Industry, false-step by standing still, or shall we stride out and grasp our fair share of this growing solid smokeless fuel business?

A decade ago, 1925, one of the prize essays in the World Coke Competition, inaugurated by the late Sir Arthur Duckham, under the nom-de-plume of "High-Low-Game," dealt in a bold constructive manner with the manifold issues of this great problem, and championed the policy that all gas-works should regularly manufacture for sale at truly relative production values two grades of solid smokeless fuels: (1) The so-called low-temperature solid smokeless fuel, and (2) the so-called high-temperature solid smokeless fuel.

In the light of to-day, this policy, viewed retrospectively, appeals with even greater force as *the one policy* to educate and to guide public thought and action aright.

Application of this policy would bring out in the form in which the great public could more readily assimilate the basic truths underlying low temperature carbonization as follows:

Gas-works coke, high-temperature solid smokeless fuel, is the residue of the carbonization of coal.

Low-temperature solid smokeless fuel is likewise the residue of the carbonization of coal. As Euclid teaches that things which are equal to the same thing are equal to one another, the public would quite quickly be on the right track of understanding, and would appreciate that, providing the coal is equally cleaned, graded, and blended in both cases there is little or no difference between the two residues of carbonization, whether high or low temperature of carbonization be used. If high temperature, then the baking of the coal is accelerated, with obvious economy to manufacture. If low temperature, then the baking of the coal is delayed, with obvious inefficiency in manufacture.

Furthermore, the public mind will gradually grasp the truths that the force of economic pressure and the insistent call of the gas-works for clean, graded, and blended coals are rapidly causing (1) our coal fields to install coal washeries, grading, and blending plant, so that every year a more desirable coal is getting to our gas-works, so that the efflux of time will make these two solid smokeless fuels more and more one and the same thing; and (2) history will repeat itself. Just as economic pressure caused gas-works to utilize higher and higher carbonizing temperature, so will the continued operation of economic pressure cause low-temperature installations to use higher and higher temperature. The day is not far distant when the difference between high and low temperature carbonization will be without distinction.

Therefore it is clear that our universal gas-works are the rightful homes for the most economic production and distribution of both gaseous and solid smokeless fuels.

Yours, &c.,
H. J. TOOGOOD.

"Stoke Pero,"
Hampton-on-Thames,
Aug. 13, 1935.

Personal

Mr. J. PROSSER JONES, the General Manager and Secretary of the Rhymney and Aber Gas Company, who has been with the Company for over 35 years, has retired and has been elected to a seat on the Board of Directors. Mr. BARTON GRAINGER, the Company's Engineer, has been appointed Engineer, Manager, and Secretary.

* * *

Mr. EDWARD CHADDERTON, M.Sc. (Tech.), Assistant Chemist, Oldham Gas Department, has obtained a position on the Technical Staff of Messrs. W. C. Holmes & Co., Ltd., of Huddersfield.

Obituary

The death has taken place of Mr. THOMAS PARSONS, Chairman of the Yeadon and Guiseley Gas Company. He was in his ninety-second year, and had been on the Board of the Company for over 40 years.

Forthcoming Engagements

Sept.

5.—B.C.G.A.—Yorkshire District Conference at Bradford.

9-12.—ASSOCIATION OF PUBLIC LIGHTING ENGINEERS.—Twelfth Annual Meeting and Conference in London.

12.—NORTH BRITISH ASSOCIATION.—Annual Meeting at St. Andrews.

19.—WALES AND MONMOUTHSHIRE ASSOCIATION.—Autumn Meeting at Porthcawl.

19.—S.B.G.I.—Council Meeting at 11 a.m.

20.—NORTH OF ENGLAND ASSOCIATION.—Autumn meeting at Whitby.

28-Oct. 1.—B.C.G.A.—Annual General Meeting and Conference at Edinburgh.

N.B.—There will be no meeting of the Central Executive Board of the National Gas Council or of the Central Committee of the Federation of Gas Employers during the month of August.

News in Brief

Compressed Gas is to be used as a fuel for 25 of their fleet of motor dust collecting vehicles by the municipal authorities at Vienna.

The First Prize for best decorated vehicle in connection with the Knaresborough Carnival was awarded to the Harrogate Gas Company.

A Price Reduction of from 5s. 10d. per 1,000 cu.ft. to 5s. 5d. was announced by the Directors at the annual meeting of shareholders of the Pitlochry Gaslight Company. A dividend of 7½%, tax free, was declared.

The Make of Gas at Largs for July was 5,453,500 cu.ft., an increase of 59,800 cu.ft. compared with the corresponding month of last year. From April 15 the make was 14,774,500 cu.ft., an increase of 916,000 cu.ft.

Applications are Invited for the position of Sales Manager by the Lea Bridge District Gas Company. Further particulars of the position, which carries a salary of £500 per annum, will be found in the advertisement columns of this issue.

Dividend Warrants for the half-year ended June 30, 1935, were paid on the 15th inst. by the Directors of the South Shields Gas Company at the following rates: On the consolidated stock, 4½%, and on the ordinary stock, 2¾%, both less tax.

Gas Lighting has again been selected at Banbury and the Corporation have entered into a three-year contract commencing on Jan. 1, 1936, with the Banbury Gas Light and Coke Company for the lighting of their streets. The terms of the agreement provide for any additional lamps that might be erected to improve the public lighting.

The Introduction of a Two-Part Tariff has been recommended by the Manchester Gas Committee to the City Council to encourage the extended use of gas cookers and fires. There are in Manchester 214,000 private gas consumers, and the present charge for lighting and domestic purposes varies from 3s. 3d. to 3s. 9d. per 1,000 cu.ft., subject to a discount.

A Final Dividend of 6s. 6d. per share has been declared by the Metropolitan Gas Company of Melbourne. We are informed by the Company's London Agents, Messrs. John Terry's, 296, Regent Street, W. 1, that the net profit for the year ended June 30, 1935, was £221,988, an amount of £50,000 has been transferred to the reserve account, and £70,623 has been carried forward.

"**Carnival Time in the Gas Industry**" is the title of an interesting article in the August issue of *Display*. It is contributed by Mr. Reginald Wilson, Advertising Manager of John Wright & Co., Ltd., and is illustrated by several photographs of striking carnival lorry displays by various gas undertakings. The author gives some useful hints on the subject of how to build up such displays.

An Admirable Caricature of Mr. C. M. D. Belton, Engineer, Manager, and Secretary of the Shrewsbury Gas Light Company, appeared in the *Shrewsbury Chronicle* for Aug. 9 as one of a series of well-known Salopians "in Picture and in Rhyme." Mr. Belton is a Rotarian, and his voluntary services on behalf of the Shrewsbury Show and the Local Carnival are very much appreciated in that town.

Gas for Lighthouses.—Montrose Harbour Trustees decided on Aug. 12 to intimate to the Northern Lighthouse Commissioners their intention to install gas in the lower lighthouses in preference to electricity. Oil lamps are used at present. It was stated that there is less risk of black-outs with gas which could be operated by the dock-gate staff, thus dispensing with a permanent lightkeeper in residence.

Nearly One Hundred Municipal Authorities and important bodies connected with the gas, electrical, and solid fuel industries will be represented at the Seventh Annual Conference of the National Smoke Abatement Society which is to be held at Bristol from Sept. 19 to 21. The Conference is to devote a special session to the question of smoke abatement and the coal industry, and it is anticipated that important recommendations regarding the use of raw coal will be made. Special consideration is also to be given to smokeless equipment in housing schemes, the emission of dust and grit from industrial chimneys, and the effect of smoke drift on the countryside.

Amalgamation and Grouping

United Kingdom and Rhymney and Aber.

We learn from a local correspondent that the United Kingdom Gas Corporation have acquired a controlling interest in the Rhymney and Aber Gas Company.

South-Eastern and Lewes.

The South-Eastern Gas Corporation announce that their recent offer to the stockholders of Lewes Gas Company has been accepted by the holders of a substantial majority of the issued stock of that Company.

A Prize-Winning Carnival Display

The Wandsworth and District Gas Company exhibited this decorated lorry at the hospital carnival recently held in their area of supply, and were successful in gaining three first prizes and one second prize. The display was arranged to show the method of gas production and distribution. A model coal mine showed two colliers at work, while the display was completed with gasholder and a suitable range of appliances. The display was designed and carried out by the District Superintendent, Mr. J. Davis, and the staff at Sutton Depot.

British Commercial Gas Association

Provisional Programme for Annual Meeting

The provisional programme for the twenty-fourth Annual General Meeting and Conference of the B.C.G.A. to be held in Edinburgh from Saturday, Sept. 28, to Tuesday, Oct. 1, 1935, has recently been published.

On Sept. 28 at 8 p.m. there will be a reception and dance at the Assembly Rooms, 54, George Street, the delegates being welcomed by the Rt. Hon. Sir William J. Thomson, LL.D., the Lord Provost of the City of Edinburgh. There will be an excursion to the Trossachs and facilities for golf on the Sunday. The Annual General Meeting will be held on the following day at 10 a.m. in the Freemasons' Hall, 96, George Street, when the President, Councillor Walter Muter, will deliver his Presidential Address. Then will follow an Address by Sir William S. Crawford, K.B.E., on "Advertising and Public Utilities—Why and How They Should Advertise."

The delegates will be the guests of the Convenor and Members of the Edinburgh Gas Committee at Luncheon in the Music Hall, George Street. The afternoon session will be devoted to either a Paper by Mr. Hugh Weekes on "Market Survey" and discussion, and a discussion, opened by Mr. E. J. Fottrell, Joint Manager of the National Gas Council, on "A Basis for Rate Structures," or, in the Lower Hall, a Paper on "Co-operation between Housing Authorities and the Gas Industry," which will be followed by a discussion.

On the final day, Oct. 1, at the Freemasons' Hall, there will be a display of B.C.G.A. Films, followed by the report of the Technical Sub-Committee on a year's work of the Industrial Development Centres, which will be presented by Mr. W. Dieterichs, Chairman of the Technical Sub-

Committee. Contributors to a discussion on "Training for Home Management" at the afternoon session will include Harriet Lady Findlay, Mr. T. P. Ridley, and Mrs. Eileen Murphy. A dinner will be given by the President and Members to the retiring President and Members of the Edinburgh Gas Committee in the evening at the North British Station Hotel.

Fuel for Road Transport

The subject of home-produced fuel for road transport is comprehensively dealt with in an illustrated booklet newly issued, at the price of sixpence, by the Coal Utilisation Council, Columbia House, Aldwych, London, W.C. The reader is reminded that "British road transport should be as far as possible independent of supplies of imported fuel in times of national emergency," and is shown in the booklet the abundance and variety of home supplies.

There are four categories: Motor spirit derived from coal and including benzole, low-temperature carbonization spirit, and hydrogenated spirit; solid fuel (coal or coke); compressed coal gas, and electricity. Reference is made to a demonstration organized by the Coal Utilisation Council in Old Palace Yard, Westminster, when Members of both Houses of Parliament and others were shown a range of working vehicles, including a private car driven on spirit produced by low-temperature carbonization, a silent, smokeless, steam-driven lorry with pneumatic tyres running on coal or coke, another lorry running on compressed gas, and a selection of the latest types of light delivery vans propelled by electricity.

The booklet deals separately with these vehicles and their fuels, and provides full details which should be of great interest to the transport owner.

B.S.I. Handbook

The British Standards Institution has issued its half-yearly Handbook, which includes the Annual Report for 1934-35, presented at the last annual general meeting, as well as the indexed list of current British Standard Specifications. The report on the activities of the three Divisions—Engineering, Building, and Chemical—provides interesting reading and shows the enormous amount of valuable work voluntarily carried out by the Institution's 700 technical committees.

Sections showing the current list of B.S. Specifications and those in course of preparation are followed by a complete subject index.

In view of the large number of British Standard Specifications now available, this index should be in the hands of all technical and purchasing departments of public authorities and firms throughout the country, who find the British Standards of such assistance in the preparation of contracts and tenders.

Copies of the new Handbook (under reference CD. 7000) are available from the British Standards Institution, Publications Department, 28, Victoria Street, London, S.W. 1, price 1s. 4d. post free.

Fine Gas Exhibition In Australia

In connection with the Royal Easter Show at Sydney last April, the Australian Gas Light Company arranged an Exhibition of Gas Appliances, some glimpses of which we reproduce on this page.

Heating and Ventilating Display.

The Company's Exhibit, which attracted very favourable comment and led to a considerable amount of business, had a frontage of approximately 90 ft. and covered about 1,000 sq. ft. As will be observed from the accompanying photographs, the whole display was characterized by a modernistic theme, and was very comprehensive in nature. Sections were devoted to gas fires in attractive settings, a feature of which was the special setting which consisted of a complete unit in polished and figured maple, containing panel type gas fire, radio receiver, and bookshelf. The water heating display covered every phase of this service from multi-point machines to small sink heaters, all of which were shown in operation. The heating and ventilating display was of particular interest, showing as it did examples of air heating units, laundry dryers, &c. In the gas cooker section the visitor was enabled to make a very interesting comparison between British, Australian, Canadian, Belgian, French, German, and American models. There was, in addition, a modern automatic all-gas kitchen containing the unit system of cabinets, &c., sink heater, compact gas cooker, and refrigerator. There was also a Home Service Section Information Bureau. The whole display was designed and constructed by the Australian Gas Light Company's staff.

Above.—General view of a section of the Exhibition, showing a number of the special displays, together with the central clock tower.

Left.—An international display of modern gas cookers, showing British, Australian, Canadian, Belgian, French, German, and American models.

Bottled Gas

Progress of Calor Gas

It is evident that considerable interest is being evinced in many quarters of the Industry in the progress of "Calor gas" distribution, to the introduction of which we referred in the "JOURNAL" for July 24. Recent enquiry of the producers, Calor Gas (Distributing) Company, Ltd., elicits the information that the response to the scheme has already, albeit holiday time, exceeded the most sanguine expectations. Numerous enquiries from all parts indicate that there is a very wide field for the application of this "bottled gas" in the outlying districts to which the extension of coal gas mains at the present time would be an uneconomic proposition.

It is naturally the producers' wish that, the Gas Industry being most interested in the furtherance of the scheme, the local gas undertaking shall, wherever possible, be the distributor of "Calor gas" for its own district; and with this end in view, gas undertakings are being given the first opportunity of accepting agencies for the distribution of the gas. Where, however, as is the case in a few areas, they are not interested, the agency is offered to a suitable local firm which is in a position to organize an enterprising sales campaign. We are informed that already more than two-thirds of the territorial area of the country has been allotted agents, either inside or outside the Gas Industry, and that among these is a powerful group who have contracted to take 22 million cu.ft. of the gas over yearly periods.

Many private enquiries which have also been received are being passed on to the district agents. Many residents in isolated country houses have adopted this convenient means of lighting, cooking, and heating, while several yacht owners are interested in an excellent opportunity of equipping their boats on up-to-date lines. We hear, too, that one gas undertaking which has a considerable number of scattered residences on the outskirts of its area has decided to use "Calor gas" as an experiment to gauge the response of consumers to gas supply before launching upon definite mains extensions. Incidentally, it is pointed out that appliances will need only small adjustment in the event of a change-over.

The Calor Gas Company keep a close check upon actual consumption of the gas; every agent being asked to furnish a monthly return of consumers and appliances. They are thus able to forestall any chance of dissatisfaction being created by the supply of gas running out before the anticipated time.

To further their campaign, the Calor Gas Company will shortly stage a novel exhibition to put their product officially before the public eye. As we have previously pointed out, "Calor gas" can not only pave the way for the eventual introduction of coal gas, but be the means of obtaining isolated consumers to whom it may never be economically possible to extend the coal gas mains. It has obvious advantages where electrical competition in outlying areas is concerned. Gas undertakings which are interested in the scheme will do well—if they have not already done so—to secure the distribution rights which are offered them in their areas of supply.

The Newbridge Gas Switch

An Optional Block System of Charge

Gas undertakings who are concerned with the retention and extension of the lighting load will be interested in the new offer which is being made by the Horstmann Gear Company, Ltd., in an endeavour to pass on to the Industry the advantages of increased production and to enable them to give practical application to the slogan "Gas Lighting Means Switch Lighting."

It is hardly necessary to say that the use of switches as an essential adjunct of every domestic lighting point would be standardized by the majority of gas undertakings, in the same way as a switch is an essential part of electric lighting, provided reliable switches were available at very low prices.

The cost of production of Newbridge switches is governed very largely by the quantities manufactured. Certain overhead charges remain fairly constant whether the output is 1,000 or 20,000 switches per week. Materials likewise can be purchased much more favourably in really large quantities than in relatively small ones.

Small and medium sized gas undertakings are obviously not in a position to place large orders for switches, but it is equally obvious that if an important proportion of the smaller undertakings are placing good and regular business with them, the firm are obtaining the benefit they seek—namely, a large output.

They have therefore endeavoured to arrive at a scale of prices for switches which will enable *any* gas undertaking (large or small) immediately to commence a vigorous switch campaign by offering Newbridge switches on such terms as will be conducive to obtaining considerable business.

After careful consideration it has been decided to offer Newbridge gas switches on an optional block system. For this purpose a gas undertaking's purchases of switches for a period of twelve months will comprise two blocks.

The first block for all types of switches will be charged at list price, less 15%.

The prices for the second block (being in excess of the first block) will be at the following special prices:

By-pass type switches.—List price, less 15%, less 40%.

Electro-catalytic ignition switches.—List price, less 15%, less 25%.

Gas fire switches.—List price, less 15%, less 25%.

The number of switches in the first block is based on the total number of consumers supplied by the undertaking.

To arrive at the number for the first block the total number of consumers is divided by 50.

It will be evident that the greater the quantity of switches ordered by a gas undertaking, the lower the average price will be, and this new scale of charges will enable gas undertakings to consider a gas switch campaign on different lines from anything possible in the past.

This optional block system of charging will come into operation immediately, and it is conditional that undertakings intending to take advantage of this offer should notify the Horstmann Company. An addressed business reply card is enclosed with the explanatory leaflet which the firm are circulating to gas undertakings.

Gas Undertakings' Results

Alloa.

At a recent meeting of the Gas Committee of the Alloa Town Council the accounts for the year to May 15, 1935, were presented by the Convener, Bailie McKinlay. Coal cost £11,476, maintenance of works and plant £3,930, repairs and maintenance of pipes, meters, and cookers £4,056, general administration £426, superannuation for all workers and officials £588, expenses of Alloa and District Gas Act £1,178. The total wages paid for the year amounted to £9,719. Local taxation accounted for the large sum of £4,646. Income from sale of gas, including Tillicoultry area of supply, £35,230; from the residual products—coke, crude tar, road tar, and oils, and sulphate of ammonia—£6,398, rents of property, £144. The gross profit on the year's working amounted to £11,809. This profit met a sinking fund payment of £3,881, interest on loans £3,551, income-tax £1,098, bad debts £29, instalment of Tillicoultry loan £275, leaving a net profit of £2,976, this sum being credited to net revenue account. The quantity of gas made for the year was 240 million cu.ft., requiring 13,360 tons of coal. The quantity of gas sold was 216 million cu.ft., the average price obtained being 3s. 0·77d. per 1,000 cu.ft., or 8·35d. per therm. The capital debt amounts to £67,104, equal to £271 per million cu.ft. of gas made. Included in the year's accounts are the results of working of the Tillicoultry supply with a sale of 27½ million cu.ft. The Alloa Gas Order was obtained on Aug. 15, 1934. The Undertaking of the Tillicoultry Gas Company, however, had been acquired by Alloa Town Council by agreement fully a year previous—namely, as from June 15, 1933. The profit yielded to the Alloa Gas Department up to the official date of taking over in August, 1934, was £1,285, and this sum was sufficient to pay off Parliamentary and other expenses in acquiring the Tillicoultry Undertaking. The purchase price of the Tillicoultry Undertaking was £17,750, equal to £634 per million cu.ft. of gas sold.

Lymm.

The Lymm Urban District Council Gas Department report a gross profit for the financial year ended March 31 of £1,804. After allowing for loan charges, capital expenditure, and income-tax for three years, the net revenue shows a loss of £146, which reduces the net revenue appropriation account balance from £2,403 to £2,256.

[*Further Undertakings' Results will be found on pp.* 426-27]

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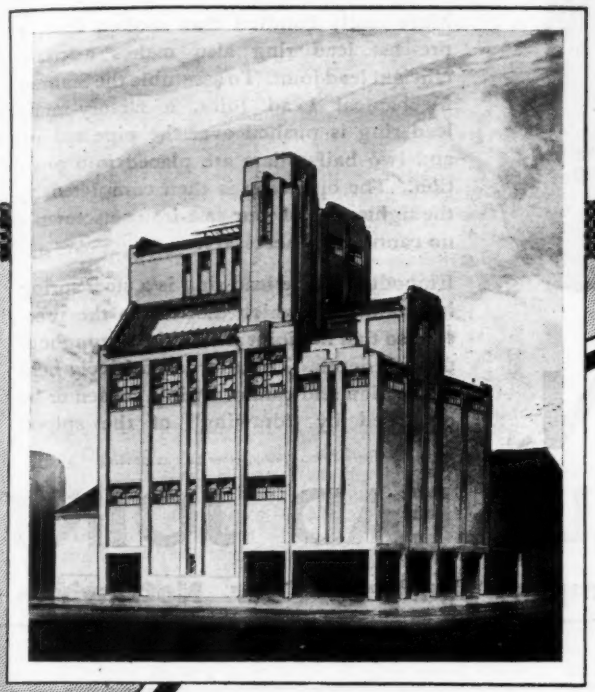

Design Drawing for the new Installation at Loughborough

INSTALLATIONS IN COURSE OF CONSTRUCTION

	Capacity in Tons per Day
ALGIERS (North Africa)	213
BARI (Italy)	24
BIRMINGHAM (9th Installation; Windsor Street)	591
BRECON	10
CHESTER	132
ELGIN (2nd Installation)	12
EPPING	25
ILKESTON	65
LIVERPOOL (3rd Installation)	153
LOUGHBOROUGH	42
ROME (Italy)	304
STOURBRIDGE (3rd Installation)	63
WANDSWORTH (2nd Installation)	200

Modernisation and Reconstruction Work is in progress at:—
BIRMINGHAM, HULL, SMETHWICK, NOTTINGHAM, MARGATE, KENDAL, STOCKPORT, GREENOCK, IPSWICH, GLOSSOP AND KENSAL GREEN

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Embodied in the lead ring is a steel spring insertion ring which distributes the pressure so that the joint is effective throughout the full depth. The ring is positively held in position and cannot shrink, loosen or be displaced by "drawing" of the spigot.

Patent No. 404955, other patents pending

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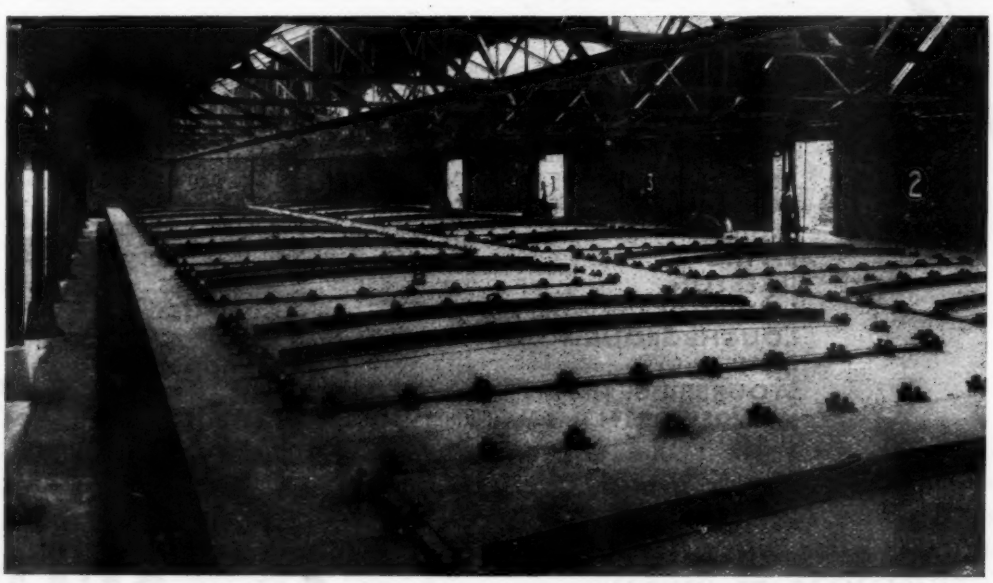
The Stanton Ironworks Company Limited, Near Nottingham



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Irish Association of Gas Managers

The Annual Meeting of the Irish Association of Gas Managers was held at Jury's Hotel, Dublin, on Aug. 13, under the Presidency of Mr. J. A. ROONEY, of Drogheda.

Largely attended, and indicative of cheerfulness and determination in word and action, this year's meeting of the Irish Association, which was held on Tuesday, Aug. 13, in Jury's Hotel, Dublin, should make history. In Mr. J. A. Rooney, of Drogheda, there was a President from a district marked by great events and full of associations with the past; but he and the other speakers showed that their minds are upon the great future which lies to the hand of the Gas Industry.

There was no dull moment during the business, the dinner, or the excursion to the home of the President on the day following. Many old friends met again, and new friendships also were formed. During the proceedings, or some part of them, there were present Mrs. J. A. Rooney; Col. W. Moncrieff Carr, President of The Institution of Gas Engineers, and Mrs. Carr, with Mr. J. R. W. Alexander, the Secretary; Mr. E. J. Fottrell, Joint Manager of the National Gas Council of Great Britain and Ireland; Mr. J. C. Walker, General Secretary of the British Commercial Gas Association, and Mrs. Eileen Murphy, Home Service Director of the Association; and Mr. and Mrs. J. W. McLusky, of Glasgow. Apologies for absence were received from Mr. J. D. Smith and Mr. J. L. Hyslop, of Belfast; Mr. J. M'Nicholl, of Cork; and Mr. R. Bruce Anderson, of London.

The popular Lord Mayor of the city, Alderman Alfred Byrne, T.D., was present to welcome the visitors to Dublin, and he, at the very outset, struck the note of optimism which was to prevail. "I think," he said, "that the future of gas in Dublin is such as to give great hope to all interested in the Industry." But in spite of all that had been done, he went on to say that there still remained great room for development. He had expressed the hope that the Gas Company in Dublin would suggest to the Corporation that they would light by gas some of the principal streets free of charge for a few years. He wanted to congratulate the Gas Company on their enterprise in connection with their magnificent premises; and their demonstration of what gas was capable of accomplishing showed much initiative and determination on the part of those at the head of affairs. But one of the things they had not done was to take charge of a small block of streets and show the citizens what could be done in the way of public lighting by gas. If they would do this, he thought that in a few years they would discover that the initial outlay had been repaid a hundredfold. In saying this, he did not want to be taken as opposing the Electricity Supply Board; each had its own sphere. The Electricity Supply Board was giving good employment, but no better than the Gas Industry.

Presidential Address.

After the Lord Mayor had been heartily thanked for welcoming the Association to Dublin, the President proceeded to deliver his Address, which was published on pp. 361-362 of last week's "JOURNAL."

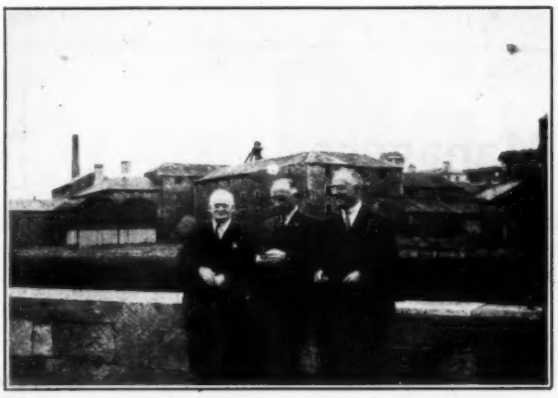
Mr. H. W. SAVILLE (Wexford) proposed a cordial vote of thanks to the President for having dealt so thoroughly with the Gas Industry as it related to Ireland, and particularly to the Free State, and for having stressed their difficulties and their hopes.

The Institution President's Optimism.

Col. CARR said it afforded him great pleasure to second the vote of thanks to the President for his very able Address; and he knew he would be forgiven if he ventured to differ from him in one aspect only. But in differing, he would only do so to the extent of endeavouring to emphasize a point the President had made—that gas must transcend in its own sphere. Governments might interfere—unfortunately they did interfere, not only in the Irish Free State, but on the other side of the Channel also—and they felt that in this interference there was a certain amount of discrimination against gas. But however this might be, he felt confident that in course of time that which was best and most economic must prevail. Unfair taxes could be imposed for a time; but he had such faith in the common sense of the public—of the public in Great Britain and of the public in the Irish Free State—that he felt convinced that in the long run that which was truly logical and economic would prevail. ["Hear, hear."] Self-interest, whether it be the self-interest that was set up by a Government in the boosting of one industry against another, or anything else, must be subverted to the goodwill of the whole of the populace.

"Therefore," proceeded Mr. Carr, "I believe that the Gas Industry in Ireland is, like the Gas Industry of Great Britain, only at the commencement of its development. In spite of all that is done by your Government in the pushing of electricity—in spite of all that is done by the British Government in the pushing of electricity on the other side—in the long run the fact that gas is the cheapest source of clean and conveniently usable heat is bound to prevail, and the public will eventually demand the cheapest and best fuel, which is gas. On the other side of the Atlantic, where huge water power schemes for generating electricity are in operation, one sees side by side with the electricity stations enormous gasholders containing fundamental heat, which is something electricity can never be.

Irish Association of Gas Managers with Friends at Drogheda.



Sooner or later that is going to be appreciated, not only in the Irish Free State, but in every country where coal is procurable. We of the Senior Association—and I as its President—are delighted to be with you to-day, to offer congratulations on the Presidential Address. We look forward to great progress by the Gas Industry of Ireland during the coming year, and I can promise you any co-operation and help which we in the parent Institution may be able to extend to you."

The PRESIDENT, acknowledging the vote, said the remarks that had been made by the mover and seconder would be extremely helpful to the whole of the members. He expressed his delight at the presence of so many distinguished visitors, and the hope that they would return home with pleasant memories of the meeting.

President's Medal.

Col. CARR said that, while thanking the President on behalf of the visitors for his cordial welcome, he had the added pleasure (in the regretted absence of the Immediate Past-President, Mr. J. L. Hyslop) of presenting to Mr. Rooney the President's Medal of the Association. In doing this, he would like to emphasize what the President had told the members—that they must give the maximum amount of attention to the selling of gas. A more fitting message than this he could not have given to the members. All would be encouraged by what the President had said to put forward greater efforts on the selling side. He asked Mr. Rooney's acceptance of the President's Medal and congratulated him upon the high position he had attained.

The PRESIDENT expressed his indebtedness to them all, and particularly to their devoted Secretary. Any work done, or anything done for any of the members, had been done by his friend Mr. Airth. Without such a man as their Secretary, he did not know what the Association would do.

An Institution Certificate.

Col. CARR next congratulated Mr. H. C. Harrison, of Belfast, upon having obtained the higher grade certificate in Gas Engineering, second class, of The Institution of Gas Engineers, which he presented to him.

Committee's Report and Accounts.

Mr. GEORGE AIRTH, of Dundalk (Hon. Secretary and Treasurer), then presented the following report of the Committee:

The Committee, in presenting their annual report, beg to congratulate the members on the continued prosperity of the Association. The annual meeting held in Belfast was very largely attended, and the Papers read were very interesting, and caused a good discussion. The Papers to be read to-day are of an interesting nature, and should lead to useful discussion.

Your Committee regret to have to record the death of one of our oldest members, Mr. R. F. Byron, of Monaghan. Mr. Byron joined the Association in 1899, and continued a member till his death. He was one of the pioneers of "Gas for Cooking," and wrote a very interesting Paper on this subject for our annual meeting in Waterford in 1904. His physical infirmity was his heart. That he suffered no pain, as the heart so often causes, must be a source of great consolation to those near and dear to him who are bereaved. Mr. Byron was on gas-works all his life, being the son of the late Mr. Francis J. Byron, of Nenagh. When Mr. F. J. Byron died, he succeeded him in Nenagh, and in 1921 became the Manager of the Monaghan Gas and Lighting Company. Your Secretary has written to Mrs. Byron and family sympathizing with them, on your behalf, for the great loss they have sustained.

Owing to legislature in the Free State your Committee have had a busy time trying to get the Government to see our side of the question. The continued imposition of 5s. per ton on all coals imported is a very heavy burden, and no amount of correspondence seems to have any effect on the Ministry of Industry and Commerce. The quota system has hit us also, as the Government will only alter the amount they allow after continued efforts on behalf of each Company who find the amount too small for their requirements. Efforts are being made by a Committee to have the coal tariff removed for gas-works (it being raw material for us), and perhaps Mr. Edmonds will tell us more of the efforts of this Committee at the meeting of the B.C.G.A. this afternoon.

A deputation of our Committee met the Minister for Industry and Commerce in regard to making a larger market for Road Board tar. It was pointed out to him that in the last two years the amount of Road Board tar used had fallen by 4,700 tons—in other words, from 11,000 to 6,300 tons. The stocks of crude tar were increasing to such an extent that some gas-works had little capacity left, and were in a dangerous position for more room, as they could not carry large stocks. The imposition of one penny per gallon put on by the Imperial Government and the Government of Northern Ireland made the sale of tar almost impossible, and the average price for tar had fallen from 3·925d. in 1930 to 1·084d. in 1934, and was still falling. The Minister regretted he was unable to sanction the inclusion of tar exports in the bounty arrangements of his Department. Your Committee then had a further interview with the Department of Local Government and Public Health, with much more favourable results, provided every manager of gas-works did his utmost to become a salesman for Road Board tar by interviewing his local and county surveyors and impressing on them the necessity of using Road Board tar instead of imported bitumen and tar bitumen mixtures. The Department undertook (though it was late for this season) to do all it could unofficially to encourage surveyors to give serious consideration to the more extended use of tar, but pointed out that the undertakings themselves should do their part, and recognize that the Department's efforts will be, in the nature of things, supplemental.

The tar supplied will be subject to analysis by the State Laboratory. If the provincial gas undertakings make a serious effort to help themselves, they may be assured of the goodwill of the Department as far as practicable. They must, however, bear in mind that the Department, while willing to help them, cannot force the engineers of local authorities to use tar in preference to another road dressing, particularly in counties where the climatic conditions are not suitable. Our President has mentioned the tar question in his address, and we ask you to give it your most serious consideration. Your Committee would like to impress upon you the necessity of answering all queries sent to you, as early as possible, so that your Secretary can reply to the various queries put by the Government Departments as early as possible. Your Committee would like to acknowledge the assistance given by Mr. Dumbleton, of Dublin, who assisted us on these deputations.

On the 1st of August the stocks of tar in the Free State were 1,130,000 gallons, and of Road Board tar 20,850 gallons.

The number of ballot papers received this year is 39. More should be sent on.

The balance to credit in the Treasurer's hands this year is £165 8s. 1d., as compared with £153 6s. 8d. in the preceding year.

Mr. L. P. PHILLIPS (Dublin), the Auditor, next summarized the balance-sheet, remarking that the amount of £165 8s. 1d. in hand was highly satisfactory.

Mr. F. J. EDMONDS (Waterford), moving the adoption of the report and accounts, said there were points of very great importance which required to be placed before the members, and he urged them all to be present at the afternoon's private session. They must heartily congratulate the Committee upon the work they had done during the past year. The interests of the members had been closely watched over, and this had required a great deal of time. Their Secretary was highly esteemed, and his services deeply appreciated.

Mr. G. WALMSLEY (Londonderry), seconding, said, "the Senior Association are proud of their permanent officials, and we should be equally proud of those whom I may call our permanent officials. I hope we shall have them for many years to watch over us."

The report and accounts were then adopted.

Office-Bearers and New Members.

Messrs. W. Cole (Dublin) and J. Oxley (London) were appointed Scrutineers of the ballot papers, and subsequently reported the following elections:

President.—P. J. M'Evoy, Midleton, Co. Cork.
Vice-President.—J. A. Pemberton, Sligo.
Members of Committee.—A. Robin, Holywood; L. G. Young, Carlow; A. Kirkham, Enniscorthy; and A. Law, Limerick.
District Representative to Council of Institution of Gas Engineers.—J. A. Rooney, Drogheda.
Auditor.—L. P. Phillips, Dublin.
Hon. Secretary and Treasurer.—G. Airth, Dundalk.
As Ordinary Members.—Maurice Wilson, Tralee; J. W. McLusky, Glasgow; J. P. Clarke, Cavan; P. J. Sheehan, Cork; and W. Scotland, Bangor.

As Extraordinary Members.—P. C. Booth, Leicester; C. Gray, Leigh-on-Sea; R. Halcolm, Stirling; A. Hayhurst, Belfast; J. J. Connely, Dublin; J. P. Rehill, Dublin; P. McLoughlan, Dublin; F. Jackson, Birmingham; and J. F. West, Manchester.

Report of the District Representative on the Council of The Institution of Gas Engineers.

The report of the President, as district representative on the Institution Council, was in the following terms:

As the representative of the Irish Association on the Council of The Institution of Gas Engineers, I have attended two meetings in London, and received a cordial reception. There were many matters of interest discussed—among others gas leakage in streets—which have been reported in the Gas Press. Reports also from the different Committees on Research were discussed, and valuable information obtained from them. All these reports have been published. The Educational Scheme of the Institution continues to have good effects, and many young engineers present themselves at the examinations. This speaks well for the future of our Industry.

Papers Read.

Papers were then submitted to the meeting as follows, that by Mr. D. A. Pratt being published on later pages of this issue.

"Care and Maintenance of Gasholders," by P. C. Booth.
"What of the Future of Gas in Ireland?" by D. A. Pratt.
"Gas Refrigeration," by J. P. Morrison.

Before adjourning to join the ladies and partake with them of light refreshments, on the invitation of Mr. Rooney,

The PRESIDENT congratulated Mr. M'Evoy on his election to preside over the affairs of the Association during the next twelve months.

Mr. P. J. M'EVOY acknowledged the honour that had been done him, and promised to do everything he could for the Association. He made an appeal to the members to co-operate with the Committee in the preparation of an attractive programme for the next meeting.

Irish District Executive Board of the National Gas Council.

The fourteenth annual meeting of the Irish District Executive Board of the National Gas Council was held in Jury's Hotel on Tuesday afternoon. In the absence of the Chairman, Mr. J. Ronan (Waterford) presided. Mr. J. D. Smith (Belfast) was unanimously re-elected Chairman for the ensuing year, and Mr. W. J. Grey (Dublin) and Mr. J. Ronan were unanimously re-elected Vice-Chairmen.

The following Management Committee was elected:

Mr. G. Airth, Mr. George Anderson, Mr. W. J. Grey, Mr. J. M'Nicholl, Mr. B. Mitchell, Mr. W. M. Pettigrew, Mr. A. Robin, Mr. J. A. Rooney, Mr. J. D. Smith, and Mr. G. Walmsley.

The following were appointed representatives on the Central Executive Board:

Mr. George Anderson, Mr. W. J. Grey, Mr. J. M'Nicholl, and Mr. J. D. Smith.

Mr. A. S. Brook and Mr. F. J. Edmonds were re-appointed Joint Hon. Secretaries.

The Chairman referred to the steps which he had taken, in conjunction with Mr. George Anderson and Mr. Edmonds, with a view to obtaining some measure of exemption for gas undertakings in the Free State from the import duty of 5s. per ton of coal.

The Chairman also reported briefly the amendments which had been put down to the Conditions of Employment Bill, the majority of which the Government of the Irish Free State had stated their willingness to accept.

The question of the future constitution of the District Executive Board for Ireland was, after discussion, referred to the Management Committee for report.

Mr. E. J. Fottrell, Mr. J. C. Walker, and Mrs. Eileen Murphy spoke of the work of the National Gas Council, the B.C.G.A., and the Women's Gas Council, and referred to the value of the assistance which these organizations were ready to give to undertakings in Ireland.

Annual Dinner.

In the evening members and friends met again at dinner in Jury's Hotel, when speeches were intermingled with a first-rate musical programme. The President was in the chair, and the Lord Mayor was among the company present.

Mr. F. J. EDMONDS, proposing "The Gas Industry and Kindred Associations," said it was one that had been honoured ever since the inception of the Association, but the number of these organizations had increased, which showed that there had been great development in matters connected with the Industry. At their meetings the Association rightly said that they recognized no borders or politics. But while this was so, circumstances had arisen which were building a wall that had to be surmounted. Barriers that were gradually rising up against the Industry made it all the more necessary that they should recognize the value of these kindred Associations. They had with them that evening Col. Carr, who was honoured by being Presi-

dent of The Institution of Gas Engineers. Col. Carr had had a long career in the Gas Industry, and he had shown them at the meeting that day his fitness for his high position. They also had with them representatives of the other national bodies, but he had to refer specially to the Secretary of the Institution, Mr. Alexander, who had endeared himself to all with whom he had come in contact. He had shown great tact, and was always ready to help a lame dog over a style.

Col. CARR, responding, said that the Irish meeting was the third opportunity since he became President of the Institution that he had had of speaking at a gathering of brother engineers. The first was in Germany, and the second was in Belgium. He was proud to have been honoured by his colleagues in the Industry by election as President of the Institution, and he fully realized the responsibility attaching to the position—a responsibility that was going to be great in his year of office, and perhaps even greater in the years of those who were to follow him. But he would go through his year with a feeling of intense optimism. There were great and prosperous times ahead of them. If they fully appreciated the real situation, they could afford to be happy. A year ago he was privileged, in the absence of the Institution President, to visit Ireland as his deputy, and he was delighted to be with them again that evening.

Mr. ALEXANDER and Mr. WALKER also replied, and each acknowledged the cordiality of the welcome extended by the Irish Association.

Mr. M'EVOY asked those present to drink the health of the President and Mrs. Rooney. The Association was deeply indebted to the President for the tact and ability he had displayed during his year of office.

The PRESIDENT replied that he had endeavoured to do his duty to the Association and to the Gas Industry as a whole; and with the assistance of his Committee and his wife he had got through.

"Prosperity to the City of Dublin" was proposed by Mr. J. W. MCLUSKY, who said that Dublin through all vicissitudes remained the same city with the same characteristics as of old. So far as their own Industry was concerned, Dublin was certainly progressive, for it provided gas in the kitchens on its housing estates. Gas must go in eventually, and it was better and cheaper to put it in at the start than later on. Gas was a great democratic movement.

The LORD MAYOR said it was true that the Gas Company in Dublin, and gas undertakings elsewhere, were providing gas in the homes of Ireland, and with some of their spare cash they should come along and assist the municipalities to provide good houses and at the same time provide customers for themselves. There was no better investment and no greater security in the country than the stocks of the municipalities, and when gas companies had money to invest they should share the responsibilities of the public authorities who were doing so much to provide them with good customers.

Sir THOMAS ROBINSON, who also replied, pointed out that the Lord Mayor was very rightly enjoying his sixth year of office.

The remaining toasts were "The Ladies," proposed by Mr. S. HALL (in the absence of Col. Glover, to whom the pleasurable duty had been allotted), and responded to by Mrs. EILEEN MURPHY; and "The Press," which was submitted by Captain ANDERSON, and replied to by Mr. ALFRED HARRISON.

Drogheda Visited.

Wednesday was, as usual, devoted to a day's excursion, in which just about one hundred took part. It took the form of a motor tour from Dublin, by way of Navan, through country of intense interest, to Drogheda, where lunch was served in the Mayoralty Hall. Then the drive was resumed to Bettystown, where tea was partaken of, after which the party returned by another route to the city. The sites were viewed of many famous tumuli, on spots whose history extends back to the Bronze Age. To the Dowth Cairn, we are told, considerable extensions were made in 2000 B.C., and further additions as late as the Christian period. Visits were paid to Mellifont Abbey (the ruins of the first Cistercian Monastery to be founded in Ireland) and to Monasterboice, the site of a fifth century monastery, where there is a remarkable cross 27 feet high and elaborately carved.

Historic Drogheda would require more hours than the visitors had minutes to unearth one-half of its treasures, and so it was necessary to confine attention almost exclusively to the excellent lunch which was awaiting the party. The President referred with regret to the absence of the Mayor (Alderman Walsh), who had, however, sent a message of good wishes, and an able deputy in the person of Mr. Joseph Carr, the Town Clerk.

Mr. Carr extended a hearty welcome to the visitors, and said the Mayor had been much looking forward to the privilege of meeting them. The citizens of Drogheda were very proud to know that their Gas Manager had been President of the Association for the past year, and they felt sure Mr. Rooney had filled the position with dignity to himself and with benefit to the Association. It was only during the last few years that electricity had come among them in the smaller towns, but since the advent of the Shannon supply in Drogheda the total gas sales had increased enormously. That had been the experience also in other towns. A well managed and efficiently run gas undertaking was bound to hold its own against an electricity undertaking, because gas for heating could not be excelled.

In the course of a few remarks, Mr. M'Evoy declared the trip to have been most enjoyable—a statement with which all present were in cordial agreement, thanks to the thoroughness with which the arrangements had been made by Mr. Airth and others responsible. Continuing his remarks, Mr. M'Evoy said he agreed that no Government worthy of the name could have done anything other than their own Government had done, with the resources of the Shannon at hand. Gas Managers were not opposed to the scheme as a scheme.

A number of members remained in Dublin until the following morning, when the usual golf competition took place.

Golf Competition.

The Golf Competition was played at the Castle Golf Club, Dublin, on the Thursday. The scratch score for this course is 74.

The results were as follows:

GRANT CUP AND REPLICA.

J. K. Harrison (Armagh) 70

CAPTAIN'S PRIZE (BEST GROSS). Presented by A. Law (Limerick).

W. F. Ross (Glasgow) 71

GRANT CUP (RUNNER-UP).

Allan Robin (Holywood) 72

SECOND BEST GROSS.

Douglas H. Munro (Glasgow) 74

PRIZES FOR HIDDEN HOLES.

I. D. Hamilton (Belfast), P. J. Rooney (Strabane), W. Cole (Dublin).

LADIES' PUTTING COMPETITION.

Miss Evelyn Rooney (Drogheda) 18
Mrs. J. W. McLusky (Glasgow) 19

The prizes were presented by Mrs. Rooney.

The Golf Officials and Committee for 1935-36 were elected as follows:

Captain . . . J. K. Harrison (Armagh).
Hon. Secretary . . I. D. Hamilton (Belfast).
Hon. Treasurer . . Allan Robin (Holywood).
Committee . . . F. J. Edmonds (Waterford); A. Law (Limerick); J. A. Rooney (Drogheda); G. Walmsley (Londonderry); and the President, P. J. M'Evoy (Midleton).

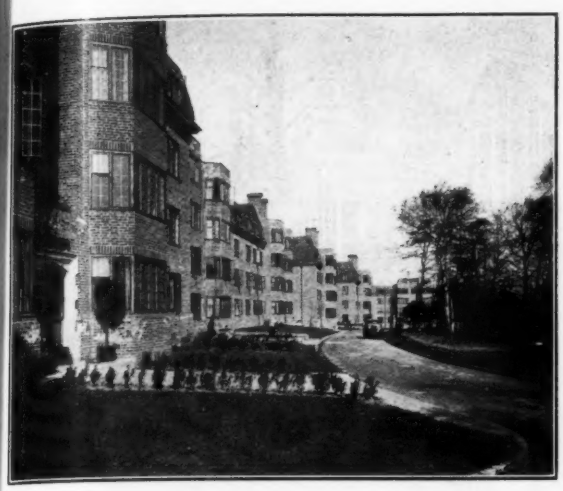
Continued Progress at Oldham

The annual statement of accounts of the Oldham Gas Department for the year ended March 31, 1935. The expenditure on capital account during the past year totals £44,467. The gross revenue for the year on gas-works accounts amounts to £281,019, and the gross expenditure to £201,476. The net profit on the year's working is £34,019. The net profit of £34,019 has been reduced by the contribution to the Borough Fund of £4,000, to the sum of £30,019. The quantity of gas manufactured at the different stations during the year was: Higginshaw Station 1,381,872,000 cu.ft. or 6,577,610 therms, Hollingwood Station 47,199,000 cu.ft. or 225,139 therms, coal gas and water gas plant 4,103,000 cu.ft. or 18,794 therms water gas.

The total make was 1,433,174,000 cu.ft. or 6,821,543 therms. The amount of coal used in its production was 78,577 tons. The total number of meters fixed at March 31 was 65,502, which is an increase of 808 as compared with last year. The number of prepayment meters in use has increased during the year from 38,933 to 40,782. 1,042 meters have been fixed in new premises and others in which gas was not previously used, and 216 meters have been permanently disconnected. At the end of the year the actual number of consumers was 59,504 and the total number of cooking stoves and grillers in use was 37,050, a net increase of 536 during the past twelve months. These figures do not take into account cooking stoves owned by consumers.

The number of high-power lamps on hire was 180, a decrease of 48 during the year. There has been a decrease in the quantity of gas consumed in houses and shops of 44,197,400 cu.ft., and an increase for mills and workshops of 8,637,700 cu.ft. The total consumptions in houses and shops, mills and workshops was 1,176,685,100 cu.ft., as compared with 1,212,244,800 cu.ft. in the previous year. The number of public street lamps of the incandescent type at March 31 was 4,105 within the Borough, and 2,286 in the Out-Townships, being an increase during the year of 101. The quantity of gas consumed by public lamps during the past year was 91,625,000 cu.ft. Compared with last year this shows an increase of 2,489,000 cu.ft.

Centralized Heating by Gravity Feed Coke Boilers



Typical View of Manor Fields.

From three perfectly equipped boiler houses automatic gravity feed coke boilers provide the central heating and a constant supply of hot water without noise or dirt in fourteen blocks of buildings comprising the Manor Fields flats at Putney.

Development in urban building is tending to substitute blocks of flats for private houses, with the object of reducing building charges and living costs. In the same way domestic services, such as heating and hot water supply, tend to become centralized—first of all in the central heating of individual buildings, and subsequently in the form of large-scale boiler equipment serving whole blocks of buildings, each stage in the evolution increasing the economy of operation.

We have described before in these columns some of the typical blocks of flats which are springing up with such rapidity in different parts of the country, with particular reference to the gas equipment which has been installed therein. On this occasion, however, we are able to refer to something entirely new in the equipment of modern flats—namely, central heating and hot water supply for large blocks of buildings all provided from a centralized coke boiler plant, the whole service being inclusive in the tenant's rent.

Through the courtesy of the London and Counties Coke Association, who co-operated with the Wandsworth and District Gas Company in the installation of the plant, we were able to inspect the equipment which supplies these essential domestic services to the Manor Field Flats, Putney, which were recently erected by John Laing & Son, Ltd., for Laing's Properties, Ltd. These flats, which represent the most modern practice, have been erected in fourteen blocks of buildings, the Architects for which were Messrs. Coleridge, Jennings, and Soimenow. The central heating and hot water are supplied from three boiler houses constructed to the design of Major M. G. Bland, O.B.E., M.Inst.C.E., of Albion T. Snell and Partners, Consulting Engineers, the engineering plant being installed for the Wandsworth Company by the Brightside Foundry and Engineering Company, Ltd.

The Flats.

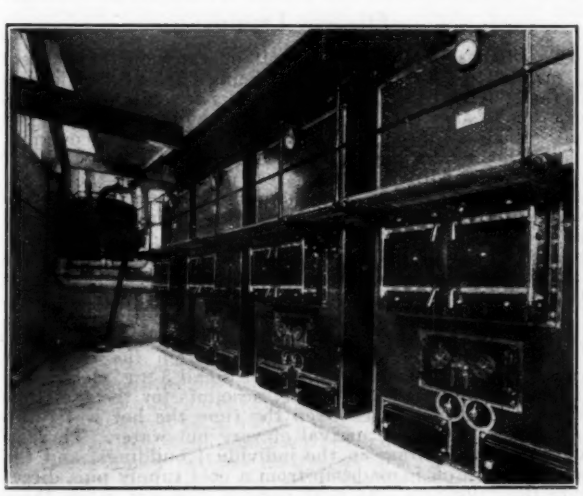
It should perhaps be made clear at the outset that the Manor Fields, Putney, may be regarded as the embodiment of modern comfort, though it must not be assumed that similar centralized boiler equipment cannot equally well, from an economic standpoint, be applied to blocks of flats of a less luxurious type. Indeed, the figures which will be given later indicate that it is definitely an attractive proposition for all concerned.

The accommodation varies from one or two reception rooms, two to six bedrooms, one or two bathrooms, and kitchen, the annual rental ranging from £165 to £460 according to size. The flats themselves, standing in beautiful grounds—which, incidentally, are excellently illuminated at night by gas lamps—are the embodiment of restrained luxury. Studded oak doors and oak window frames give an impressive appearance to each "house." Terrazzo panelled and painted walls make imposing entrances, and the rubber floors to landings and stairs, with solid oak balustrades, are in keeping with the quiet dignity of the whole. Automatic lifts lead to the various floors, separate enclosed staircases and service lifts being provided for tradesmen. The central heating radiators, with individual control, are fitted in every room, as well as the entrance hall, though there is, in addition, a fireplace in one of the reception rooms. The bedrooms, unfortunately, are flueless. The kitchens and bathrooms are attractively tiled, and the floors are covered with rubber carpet. Hot and cold water is laid on to some of the bedrooms, while a towel rail heated from the hot water system completes the bathroom equipment. A refrigerator is standard in the kitchens, while provision is made for either gas or electrical cooking according to the preference of the individual tenant. The hot water supply is absolutely constant at about 135° F. and is immediately obtainable without that annoying preliminary of running off a gallon or so of cold water.

Reliability, automatic operation and control, cleanliness, and silence were demanded of the boiler plant which was to fulfil the arduous requirements of this installation, serving a total of no fewer than 228 flats; and those responsible decided that the gravity feed coke boiler was the only apparatus which would meet these conditions fully at an economical running cost.

Oil Displaced by Coke.

The whole estate is served by three boiler houses—No. 1 serving 68 flats; No. 2 serving 96 flats; and No. 3 serving 64 flats—all of them being neatly designed buildings, unostentatiously hidden away behind the main blocks and looking not in the least like boiler houses. It is of interest to note that No. 1 boiler house, which was erected to serve the first block of flats to be completed, was equipped with automatic oil-fired boilers. The imposition of the fuel oil tax in the Budget of 1933, however, rendered the use of oil for central heating uneconomical; and, furthermore, trouble was experienced owing to the noise inseparable from the operation of oil burners. Gravity feed coke boilers were therefore adopted when the remaining two boiler houses were erected, and their operation proved so convenient and economical that a new boiler house is being



The Interior of one of the Boiler Houses, showing four of the Gravity Feed Coke Boilers.

The Exterior of No. 2 Boiler House, surmounted by Greenhouses.

constructed to accommodate a further set of coke boilers to replace the oil-burning apparatus in No. 1 house.

Boiler house No. 2, which we have chosen as the best for the purpose of this description, contains six boilers of Messrs. Hartley & Sugden's "Gravico" type, while No. 3 house has four boilers, each rated at 1¼ million B.Th.U. per hour. Four boilers of a similar rating are replacing the oil-fired equipment in No. 1 house.

Of the six boilers in No. 2 house, two are designed for domestic hot water supply and three for central heating, the sixth boiler being so arranged that it may be used in either system as a standby when required. A 19-ton storage hopper at ground level serves all six boilers which are situated immediately below. The Wandsworth and District Gas Company deliver regular supplies of suitably graded coke into this hopper, which will hold a three days' supply. The bottom of this hopper is divided into a number of chutes each leading to a position above a machine faced sliding door on the top of the boilers. To charge the boilers it is only necessary to slide open a door on the top of the boiler, and by means of a convenient chain to operate the cut-off gate at the foot of the chute, thus allowing the coke to fall in a steady stream into the boiler until delivery is stopped by releasing the chain.

The ash and clinker are removed from the boilers once a day and placed in bins, which are elevated to the coke store where they remain until a sufficient quantity has accumulated for removal.

Efficient Lagging.

The domestic hot water circuit operates on the indirect principle, two storage calorifiers being fixed at a high level in the boiler house. The various pipes are suitably coloured in order to distinguish the different circuits and well lagged with about an inch of "Econite" moulded pipe covering, while the boilers themselves are insulated with "Alfol" and finished with planished steel plates, with the corner angles, door handles, and frames chromium plated—the whole effect being to give a neat and cheerful appearance to the boiler house. So efficient is the pipe lagging that barely 5° in temperature is lost in transmission to the furthest draw-off tap, which must be well over 200 ft. from the boiler house.

The primary circuit from the boilers to the calorifiers operates at about 160° F., and during off-peak periods works by gravity. The secondary circuit from the calorifiers round the buildings is assisted by a small 3-H.P. electrically driven pump, which, of course, accounts for the fact that there is no time lag between the time the hot water tap is turned on and the arrival of very hot water. There is no hot water storage in the individual buildings, and the water drawn off is made up from a cold supply pipe direct into the calorifiers. At peak periods, however, when there is a considerable call for hot water, the temperature is maintained in the calorifiers by turning on a further pump which accelerates the primary circuit, so that the system is able to cope with the heaviest demands without any falling off in the delivery temperature. The supply pipes vary in diameter from 4 in. at the outset down to ¾ in. at the furthest point. The central heating system is on a direct circuit, as there is obviously no need in this instance to safeguard the cleanliness of the water by means of calorifiers.

The gravity feed boilers, as is well known, have a "V" shaped grate, and the boiler magazines hold sufficient coke for twenty-four hours' operation at full rated load. The rate of combustion at full load is set at approximately 4 lb. per sq. ft. of grate area per hour, with the result that the amount of clinker formed is very small—and therefore long periods of operation are possible without impairing efficiency. It is only necessary to clean the fires once a day and the fire tubes once a week, the latter operation being done when there is a low fire burning.

Thermostatic Control.

The rate at which the fuel burns in each boiler is regulated by means of a thermostatically-controlled one-thousandth of a horse power electrical motor, which opens or closes the primary and secondary air doors and the flue and check draught damper according to the demand for heat.

The operation of the thermostatic control for the central heating system is governed by a variostat, which controls the temperature in the flow pipe according to the external temperature. In the case of the hot water service, the boilers are controlled by a thermostat set near the bottom of the calorifiers. In each case safety devices are attached to the control apparatus, so that in the event of current failure the dampers automatically shut and do not resume function until the supply is reinstated. Experiments are being carried out on one of the boilers with the "Detroit" system of thermostatic control by way of comparison with the other type. This control works on the principle of liquid being syphoned backwards and forwards between two small cylindrical chambers according to the rise and fall in the temperature of the water. A warning light on each boiler goes on in the event of failure of the current.

In addition to thermometers on each boiler, a complete indicator panel gives the boiler house attendant all the information as to the state of the plant at a glance, including the temperature in the calorifiers.

It will be readily appreciated that the plant requires very little attention other than the routine duties of charging the boilers and removing the ash once a day, so that, in addition to the engineer-in-charge, one attendant can easily look after all three boiler houses in his day's work. During the night, the regular night-watchman looks in at each house periodically in the course of his rounds to see that all is in order, and if a warning light should happen to be showing on any of the boilers he can quickly rouse the engineer-in-charge. The central heating boilers are, of course, shut off during the summer months.

Fuel Costs.

Tests under normal working conditions have demonstrated conclusively that continuous efficiencies of over 70% are obtained from these gravity feed boilers, and the following table gives an interesting comparison between the costs of heating by coke and oil:

Fuel.	Cost per Ton.	C.V. per Lb., B.Th.U.	Average Operating Efficiency.	Relative Cost (Oil at 100).
	s. d.		%	
Coke . . .	33 8	12,500	70	53
Oil . . .	85 0	19,500	60	100

The cost of fuel for both central heating and hot water supply at Manor Fields flats, which contain, on the average, two living rooms and three bedrooms per flat, worked out during last January at approximately 6d. per day per occupied flat. At the present time some of the flats are still in process of completion and are consequently unoccupied; but the heating is used when in operation for "drying out." There is in addition, of course, a certain amount of heat loss from the domestic hot water circulating pipes which supply these unoccupied flats. But when all the flats are occupied it is confidently anticipated that the fuel cost per flat in winter will decrease to approximately 4½d. per diem.

The use of the gravity feed coke boiler enables the boiler room to be kept clean and entirely free from fuel—a most noticeable feature of the Manor Fields installation. The whole boiler plant, indeed, is spotless. Furthermore, dust, smoke, and smuts are not discharged from the chimney which runs up against one of the blocks of flats about 40 ft. from the boiler house—an important consideration when the plant is in close proximity to residential property.

Altogether this is a most interesting installation, which should do much to enhance the prestige of coke for large-scale heating of this nature. Architects and heating engineers will find much of interest in this plant, and the London and Counties Coke Association have done a good service to the Industry by the publication of an illustrated brochure in connection with the installation, setting out the general details of the plant and drawing attention to the advantages of smokeless gas coke for this class of work.

Liquid Seals in Disc Type Holders

by A. GADD

The whole effect during the up-and-down movements of the disc in a waterless gasholder may well repay careful investigation in the future, as the resulting knowledge may have an important bearing upon the whole question of sealing in holders of this class.

The difficulty of ascertaining exactly how the sealing liquid escapes past the disc in waterless gasholders during working operations is fairly obvious. The query whether leakage as ordinarily understood really occurs has frequently arisen, of late, in the mind of the writer.

By leakage is here meant a definite flow of escaping liquid, whether this flow be either continuous or discontinuous. Of course it is common knowledge that the sealing liquid which collects in the holder below the disc has to be pumped up again into the seal at required periods, but the comparison of the records of pump runs, month by month throughout each year, in authentic cases of holders of large capacity, cannot fail to impress one with the remarkable divergence from regularity in the quantities of liquid so pumped up. It is difficult to reconcile this divergence with the idea of an actual flow past the disc itself.

It is true that changes in external temperature will affect the values of the relative runs, since the viscosity of the liquid will vary accordingly, but the recorded results do not appear to indicate that they follow any obvious law based upon thermal changes referred to above. Having regard to the close mechanical contact between the plates of the disc and the sides of the holder, the flow, if it exists at all, will necessarily be governed by the conditions applicable to passages of very narrow or capillary character.

The theory of flow through passages of practically capillary dimensions has, of course, been very thoroughly investigated in the past by Poiseuille, Graham, Meyer, and others, not to mention more recent names. One of the equations resulting from their efforts gives the velocity of flow in terms of a fraction in which the denominator contains the coefficient of viscosity of the liquid concerned. This therefore means that an increase in the value of the viscosity itself will correspondingly reduce the velocity value—a result which goes to indicate how an increased or high value of viscosity (which probably exists in sealing liquids of holders) will slow down the velocity of flow if the latter exists at all.

The theory, however, recognizes an important fact where a steady flow occurs, that is to say, a flow of uniform velocity past a fixed point in the system concerned; not a turbulent flow. The fact is that adjacent to the sides or surfaces of the passage involved liquid layers tend to adhere to the said surfaces or have no velocity whatever. The velocity, if any, commences at a layer or layers beyond the positions of the stationary ones. In other words, there is no "slip" of the liquid next adjacent to a surface mentioned.

This condition is applicable to liquids which tend to wet the surface, such as in the case of sealing liquids in the present problem, and does not refer to cases where a liquid such as mercury when clean has no such tendency to wet the surface it comes in contact with.

The adhering action is no doubt a molecular one which so far cannot be said to be thoroughly understood although the mathematics based upon its actual reality have been largely developed of late years. Mr. J. E. Southcombe, M.Sc., in the *Electrician* of Nov. 24, 1933, regarding the question of lubrication, has made the suggestion that at the surface of contact there exist molecules whose electro-magnetic forces are unbalanced, thus giving rise to surface energy. This of course brings in the question of the internal constitution of the atoms forming the molecule which is receiving so much attention by physicists just now. It does appear however that this matter of capillarity involves the question of the force of adherence overcoming the internal cohesive forces of the molecules of the liquid. It would appear to be a matter of the relationship of the molecular conditions of the liquid and those of the solid at which the surface of contact exists.

But for the present purpose of arriving at a conclusion, a more important consideration arises with regard to this non-slip part of liquid, which is now usually referred to as the "boundary." This non-slipping tendency, be it noted, is independent of a flow between such layers. Only when a flow is involved does the non-slipping part of the liquid become apparent in shearing stress form.

In their book on the Physics of Solids and Fluids, Professors Ewald, Pöschl, and Prandtl (published 1930, translators, Drs. Dougall and Deans), the authors show that this "boundary" so called has a depth (in molecular dimensions probably) which is increased in a certain manner when the viscosity is increased.

Now in the present problem the following conditions exist: Probably a high value of viscosity and an extremely narrow passage (molecularly considered) for the liquid of the said viscosity, and a low pressure.

The proposition is here put forth that under such conditions it is not unreasonable to suppose that the narrow passage referred to is almost if not quite filled with liquid in the non-slip condition described, and that therefore flow in the ordinary manner understood does not occur. How then does the sealing liquid collect below the disc of the holder?

Practical experience would appear to indicate that liquid in a tarry condition is *left* by the disc as it rises,

which tarry liquid trickles down the inside of the holder for subsequent pumping operations. This, in view of what has already been stated herein, would appear to indicate that the action (on the rising of the disc at any rate) is not unlike that which occurs when one spreads a semi-plastic material, such as thin cement, with the aid of a broad-bladed spatula, pressure being applied to the latter as the cement is squeezed out from underneath it.

If such an analogy is allowable, it will show that in the case named the adhering tendency of the liquid on the holder causes the liquid to resist the slow upward moving tendency of the disc and is so dragged away from contact with it and left behind. No doubt a similar and opposite action takes place with regard to the boundary adjacent to the disc, the layer there being dragged upwards with the disc.

WHAT OF THE FUTURE OF

Gas in Ireland?

by D. A. PRATT

A Paper presented at the Annual Meeting of the Irish Association of Gas Managers in Dublin on Aug. 13.

When I received the invitation of the President and Secretary to contribute a Paper for this Association I gave a good deal of thought to the form it should take, so as to be of interest to the whole of those engaged in the Industry in Ireland. Conditions in Ireland are so different from those across the water that a comparison is almost impossible. I am, therefore, confining my discourse to the position of the Gas Industry in Ireland as seen by a friendly outsider, who has obtained by personal contact, over a number of years, some knowledge of the position, also the enormous difficulties with which gas suppliers are having to contend, particularly the very small concerns.

Twenty Years Ago and Now.

Let us first of all examine the position of the Gas Industry in Ireland at present, in comparison with twenty years ago. In 1914 the gas undertakings numbered one hundred and ten, whereas at the present time there are only seventy-three—a reduction of some 33%, partly due to the difficulties experienced during the war period when coal was high in price and not easy to obtain. The six works which closed down during the Great War, between 1915 and 1918, owing to the difficulty in obtaining coal and not being in a position to pay the prevailing high prices, were only very small works—one 500,000, one 750,000, one 1,000,000, two 1,500,000, and one 2,000,000 cu.ft. per annum output. Unfortunately, from 1919 to 1933 thirty-one additional works have ceased to exist, ranging from 1,000,000 to 15,000,000 cu.ft. per annum output. The loss of these thirty-seven works, involving a total annual output of over 140 million cu.ft., is surely serious enough to cause consternation among the remainder.

Lost Influence.

It means more than the bare statement I have outlined; it means that the influence of gas has entirely passed out of thirty-seven towns—a calamity which is bound to have an indirect reflection upon the rest of the community. This influence would not have had the same effect in a country of large towns and cities; but Ireland is for the most part made up of small towns and villages, largely self-contained, so that the effect of the loss is greater in consequence. Out of the seventy-three works now in operation, thirty-six have an annual output of less than ten million cu.ft. The advent of State-aided electricity, as in Britain, dealt the Irish Gas Industry a very severe blow, particularly in the south, where, unfortunately, there is not the same scope to make up a temporary decrease as our friends across the Channel possess. Consequently it came as a calamity. The difficulties are numerous, and while the Gas Industry is unfairly handicapped in comparison with its competitors, we have got to realize the position as it is and face up to it.

Gas undertakings are a national asset even for the by-products alone. Although coal of necessity has to be imported, coke is required for many industries; while tar for road making and oils produced by distillation provide a constant and widespread need. The closing down of gas-works means, therefore, that these necessary products have to be imported in greater quantities.

Is Our Position Strong?

What of the present Irish undertakings? Are they strong and virile? I am afraid that is a state of affairs which can be claimed by only a very few, but it is indeed pleasing to note that certain undertakings have successfully overcome obstacles and progressed consistently year by year. Without naming them individually, we know them and congratulate them heartily on their success and present stability. It is a well-known axiom that a chain is as strong only as its weakest link, and the problem of strengthening the Irish Gas Industry as a whole is one which should be met and tackled. Of the seventy-three undertakings mentioned, only sixteen are municipally-owned, and it is a melancholy fact that twenty-seven show a gradual decrease, while certain others are just about holding their own.

Some Suggestions.

You might very well now be thinking "Well, what suggestions have you to make?" It is an old saying that the outsider sees most of the game; and as I am fairly well acquainted with you all, it is possible that certain suggestions I have to make may be worthy of your consideration. Every gas undertaking, whether carried on by private enterprise or under municipal control, is a public service institution and is, therefore, part and parcel of the life of the community it serves, and the prosperity or otherwise of every undertaking should be regarded as of vital importance to the town. Providing a certain amount of permanent employment, contributing largely to rates and other taxes, the maintenance of even the smallest gas-works ought to be considered a local necessity. It is not to be expected, however, that in these days of keen competition the public will continue to consume gas unless it is supplied of satisfactory quality and at a price within their means. Therefore, it is opportune to ask of all those in charge of gas undertakings, large or small, "Are you, as an undertaking, doing everything possible to hold your consumers and increase your sales?" The answers I would receive to that question would vary no doubt considerably in accordance with the attitude of those comprising the executive side of the works under your control.

Qualifications.

If your directors or gas committees are not backing you up, it is not to be expected that you will be able to show the same results as would be the case if you received the solid support of those nominally in control of your works. The success or otherwise of any business depends upon those in control, and I therefore suggest that the essential qualifications required of directors and gas committee men to-day are: Leadership with the power to inspire confidence; enterprise; and determination, imbued with the real "fighting spirit." It is essential, of course, that directors and gas committee men should be "gas conscious" and have faith in the undertaking they are elected to serve. Obviously they must be men who set the right example by using gas themselves, otherwise they are indirectly assisting their competitor, thus injuring their own business, whereby you would be better without them. If your directors and gas committees are men with the qualifications I have named, together with a sound business outlook, determined that the gas undertaking in their keeping shall prosper, and that they and you have the "will to win," you need have no fear for the future.

Joint Conferences.

Meeting for Directors and Gas Committee Men.

I am conscious of the fact that directors and gas committee men are in a position to decide the destiny of your business, and much depends upon their outlook. Some-

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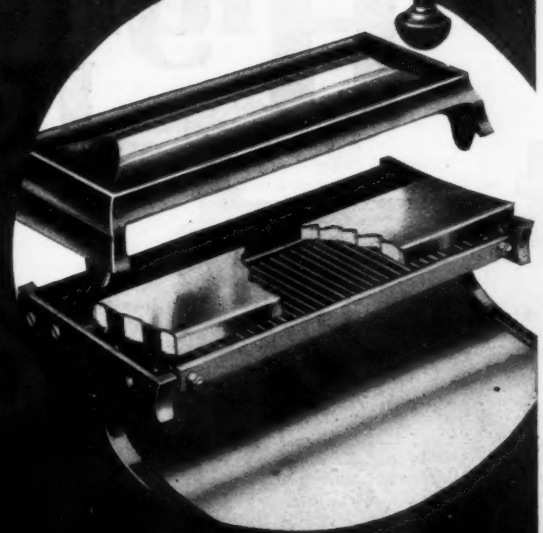

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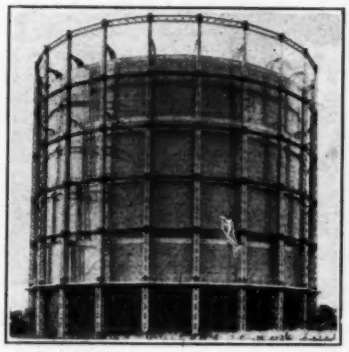

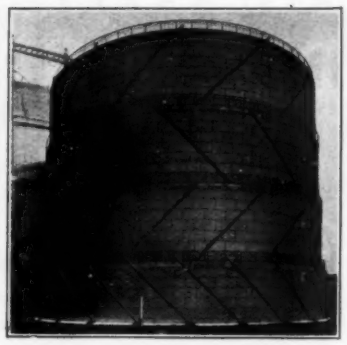

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times we meet with well meaning directors who are cautious but unenterprising. They have financial responsibility and, sincerely enough, they may occasionally doubt the wisdom of spending money upon certain schemes which you recommend as being necessary. Sometimes they are not fully informed as to the real position of our Industry and, therefore, may feel scared by the opposition being of a national character. How are they to be convinced of the true facts about our Industry?

We are meeting here to-day, and from time to time, discussing matters of importance to our Industry, and, generally speaking, we are in agreement upon important issues; but your directors and gas committee men have not the advantages we enjoy for discussion and mutual assistance. Now the Gas Industry in Ireland has reached a stage where I think the administrative forces might be to some extent pooled; and therefore I suggest that a meeting might be called of directors and gas committee men, when the whole situation could be explained. They would come into more intimate contact with others engaged in the Industry; and if they now hold merely parochial views and doubt the future, they would learn that others have prospered despite the opposition. They would learn, also, how others have surmounted the various difficulties of the times. They would learn from others of schemes which have been suggested and successfully adopted; and I believe that, as business men, such a meeting together would bring them a fresh outlook, and where depression and doubt may exist it would probably bring new hope to those who may have become, through force of circumstances, faint-hearted. Those of you who have experience of unwilling and indifferent directors would, no doubt, be pleased to have them come in contact with other directors with progressive minds and an optimistic outlook. A meeting from time to time, I feel sure, would be for the benefit of the Irish Gas Industry as a whole. It is a suggestion, I think, very well worth trying.

Necessity for Good Plant.

Your plant must be in good order. Obviously, if you are to give good service your plant should be sound to function economically and efficiently. Leakage means loss of money, and there can be no greater mistake made than "patching along" and "making it do for now." I am not suggesting rushing into heavy expenditure at once. Better have renewals carried out as needed from time to time from revenue rather than keep "putting it off" until the works are obsolete or worn out, even though it may mean deferring the payment of a dividend. In years gone by successful companies have foregone dividends in order to purchase needed plant and appliances, and in the end have reaped the reward of their foresight.

Works Well Maintained and Tidy.

It is a pleasure to go round a well-kept gas-works, however small, and whatever plant is maintained. There is no necessity for "rubbish corners," dirt and untidiness. I have been particularly pleased sometimes to be shown round a works in which the manager takes a pride in its upkeep. Gone are the days when it did not matter what the works looked like. Occasionally, in very tiny works, I have seen flower-beds round the gasholders, and recently I was shown, with a good deal of pride, adjacent to a gasholder, a small rock garden with lily-pond and goldfish therein. A short time ago I entered a little works which I had not visited for several years, and was amazed at the improvements which had recently been carried out at very small cost. The manager had constructed a fitting shop and store, making his own concrete blocks from unsaleable breeze and clinker. The actual cost had been a mere trifle, but the improvement to the works generally, and the excellent appearance, made it very well worth while. Here was a man in love with his job, and it is not surprising that the enthusiasm was infectious and reflected in the other employees; neither is it surprising that under such conditions against very fierce competition a regular increase is recorded. I would, therefore, urge every one of you to maintain a neat and tidy works which you can show with pride to visitors.

Must be Self-Reliant.

Let us have it firmly fixed in our minds that the Irish Gas Industry must survive and progress—but what methods can we suggest that will be of assistance? Interference by Government legislation is not desired. Amalgamations cannot easily be carried through, owing to the distance apart of the various towns, and acquisition by holding companies, such as obtains across the water, is in any case doubtful and not now under consideration. In my opinion, the Gas Industry can be made to prosper only by its own self-reliant efforts. The larger undertakings need no stimulus. They can, taken as a whole, be regarded as a pattern for stability and enterprise. It is the small works with which we are mainly concerned, and even they possess certain advantages over their larger colleagues.

The Personal Element.

Generally speaking, the manager and employees of these small works are known to most inhabitants of the town, and careful selection should be made when engaging employees to be sure that they are respected and favourably known in the community. Living close to your customers is a valuable asset, enabling you to gain their confidence.

Goodwill.

In this connection there is the important matter of goodwill. If your company has been in the habit of giving good and efficient service to the public, even though a certain amount of business may have been lost to electricity; if the public attitude towards you is friendly it is a very strong point in your favour. What is a fundamental necessity is to convince the public that gas is worth having, and the best for many purposes, thus creating in their minds the desire to purchase gas for the advantages it offers.

Showroom a Necessity.

I am firmly convinced that even the smallest works requires a showroom, otherwise how can you bring home to the public the knowledge of what gas appliances are available and so create the desire for their use? If anyone here disagrees with me I would put this question. Take half-a-dozen people at random in your town and ask: "What do they sell at the gas-works useful for the home?" What answers do you think would be received? Unless the public know of the existence of certain gas appliances they cannot consider utilizing them, and it is a logical certainty that they will not go down to the gas-works to find out, even if kept in stock there. In my opinion a showroom is an absolute and vital necessity to-day to keep the advantages of gas before the public. Therefore, display the latest appliances and let them know the true value and utility of gas in the domestic sphere.

To some of you, I know, the expenditure of even £50 is a matter for serious consideration, but I have known little showrooms, costing only a few pounds, which have been made very attractive. A showroom will undoubtedly pay for itself, with due attention, of course, but it is for each of you individually to decide as regards what form it should take, and what the outlay should be. I do not know of any works have a good showroom receiving proper attention that has been forced to close down.

Reasonable Price and Good Service.

We now come to the important matter of selling price. I realize that you cannot get below a certain economic level, but prices are in many cases fixed too high, and business lost in consequence. We are constantly being advised to improve our selling methods, with which I am in cordial agreement, but it is useless making a sales push unless the price is such as to make it attractive. At the same time cheapness is not everything, and we do not often enough bring home to the public the real value we are offering. We ought more often to say to them: "See what you can get for your money—good, unfailing service; well-cooked meals; instant hot water supply" and so on. "Shilling for shilling there is no expenditure you make that will return so much to you in convenience and comfort as gas." "A good fire without smoke, ashes, or attention for a penny per hour." Show them good lighting in your office and showroom, and if you are in possession of the street lighting contract see that it is good lighting. You are not likely to suffer if you can convince the public that gas is worth while. Many gas undertakings I could name have, by sheer neglect, given the impression that gas is out-of-date.

Good, efficient service to your customers is essential, and if they are satisfied with the quality of gas you supply and the attention you give, they are less likely to be inveigled into going over to other forms of light and heating. It is, therefore, of the utmost importance that you should be convinced that your customers' appliances are giving the best possible results, and that you are giving them satisfaction.

Unremunerative Consumers.

Where there are former good consumers who have succumbed to the blandishments of electric light they have become in many cases unremunerative, and thus present a problem. Where you have a meter on premises where the consumption is so small as to be hardly worth while collecting, something should be done to make their business worth while. Various methods have been adopted, in some cases a service charge, in others a considerably increased charge for the first two thousand cu.ft., and so on, but unless they can be brought into line and again become a

paying proposition they are still unsatisfactory. This brings me to another consideration.

Gas for Trade Purposes.

Have you explored the immense possibilities which are offered, even in the smallest towns, for increasing the use of gas for trade purposes? It is surprising what a large variety of uses gas can be put to, and doubtless many tradesmen would agree that for convenience, gas cannot be surpassed and has advantages over solid fuel in that it is flexible; gives an even heat; requires no storage or plant on the consumers' premises; in addition to the fact that there are no ashes or dirt to clear away. You can offer your customer a good, clean, instantaneous fuel, but the price must be attractive. Where, as in Ireland, solid fuel is expensive, there should be a chance for gas to compete.

Where heat is wanted, your slogan should be "You can do it better by gas." It then remains for you to go carefully into the question of cost and see at what price you can supply gas, and if you can but convince your customer that it is worth his while to adopt gas for the particular purpose he requires heat, you are on the way to increasing your average consumption per consumer. This would enable you to reduce the overhead charges, and it would then naturally follow that you would be able to reduce the price of gas to your domestic consumers. I am, of course, assuming that your plant is in good order, and that you could supply at least a 50% larger output than you do at present.

There are endless opportunities offered in almost any town for the use of gas for heating, but every town has its own possibilities. It is necessary for each trade to be sought out and potential customers explored. In a number of cases raw coal, oil, and electricity might, with advantage, be displaced.

Fish fryers are among the best users of gas.

Refreshment caterers, with their hot water and tea urns.

Motor garages, with brazing hearth, and they often use gas for "running in" repaired motors.

Suppliers of wireless sets and accessories require soldering irons, and stoves for heating them.

Butchers require heat for fat melting, boiling hams, &c. This trade and many others need power, the demand for which can be met by the "Demon" gas engine of ½ H.P. and upwards.

Ice cream merchants, for boiling the mixture. Hot water for cleaning purposes.

Milk retailers need boilers for sterilizing bottles, and hot water for cleaning cans, &c.

Dentists require heat for making and annealing dentures.

Printers require heat for linotype machines.

Jewellers might use gas blowpipes for repairing jewellery.

Boot repairers might use gas for blue wax and heel-ball, and for ironing and treeing.

Then on a larger scale, laundries might be induced to use gas for general work and ironing. They are generally very good consumers.

Gas-heated radiators for schools, churches, and public buildings.

Then there are, of course, possibilities in hotels, restaurants, and similar establishments.

These are just a few openings suggested to me, but there are, of course, many others which need seeking out. If the different trades are carefully examined there are many cases where heat treatment is necessary, which can be done better by gas than any other fuel.

Having now come near to the end of my Paper, I wonder if I have been able to present it in a constructive way so as to be in some way helpful. There is no panacea for our troubles, no mysterious formula that is going to achieve success. It is not sufficient just to talk over our difficulties—we must act as well. It all gets down to just plain hard work and a clear and careful analysis of the factors. We have got to recognize that the world is constantly changing, and we must readjust our viewpoints and policies frequently and make sure that we are keeping up with the requirements of our customers.

Condensed into a few words it means:

(1) We, ourselves, must have faith in our business, and that faith must be expressed in action, not in words. We must have confidence and courage to face facts.

(2) We must render adequate, efficient service at the lowest possible cost to the customer and keep on reducing the cost as much as possible to retain the business and the customer's goodwill.

(3) We must study the customers' needs and constantly strive to meet their conditions within the limit of their ability to pay.

(4) We need to advertise in an intelligent, constructive, and continuous manner, and by perseverance and personal contact.

(5) No effort should be considered too big to preach the gospel of gas to the general public we serve.

Discussion.

Mr. J. A. PEMBERTON (Sligo) said that Mr. Pratt had struck the right note in his Paper. He was evidently pro-gas rather than anti-electric, and this was a lesson which many of them would do well to take to heart. Advertising should be good, and they would do well to see that their propaganda was pro-gas, and not anti-anything. He thought they might well leave electricity alone, and look after their own business. One thing the author had omitted to mention was refrigeration by gas. He wondered what would be the feelings of their Directors or Committee-men when they read the Paper, but he felt that if some attempt was made to carry into effect the ideas of the author it would be all to the good. He proposed a hearty vote of thanks to Mr. Pratt.

Mr. P. J. M'EVOY (Midleton) said it was quite evident that the author had gone about with his eyes wide open. He was very much afraid that in most small works there had been a certain amount of inferiority complex. The Irish were an extremely conservative people, and a good many ideas which might be put forward successfully in England would cut very little ice in Ireland. Price was very important, and in the cities and towns of Ireland it was generally far too high. To try to boost gas for cooking or heating at 8s. or 9s. per 1,000 cu.ft., or rates of that kind, was out of the question. He himself was Manager of a very small works, but he had made his price competitive, and at any time that it was called for they had been quite willing to cut their rates, so as to make it worth while for people to use gas for different purposes. His undertaking had stood up to the Electricity Supply Board. He would like to mention that they had even fish fryers, and were selling gas in Midleton for that purpose as low as 3s. per 1,000 cu.ft. For a works of their size, with an output of 8 million cu.ft., he claimed that they were selling comparatively the cheapest gas in Ireland. They were not afraid of their competitors, and they were selling 15% of their gas for power; Mr. Pratt's Paper was one of the most constructive ones that had ever been presented to the Association, and he had pleasure in seconding the vote of thanks to the author.

Co-Operative Effort.

Mr. A. LAW (Limerick) said he had visited small Irish gas-works, and he felt that it was all very well for them to sit there and criticize, but all the circumstances should be taken into consideration. The small manager had to do everything and generally great credit was due to him for the manner in which he carried on his job. Such men were having a hard fight. He would like to ask whether it was not time for the Irish Association to put up some co-operative effort with the smaller undertakings, so as to help them in meeting their difficulties. It was a serious thing to learn of the loss of 37 works, involving a total annual output of over 140 million cu.ft. of gas, and he suggested that the Association should do something for an industry which was a definite asset to the country. He felt that more might be done in the way of co-operative effort to help these unfortunate men in their difficulties. Would it not be possible to enlist the support of the Government, so as to provide financial assistance for the smaller gas undertakings, in the same way as had been done for small businesses?

Mr. F. J. EDMONDS (Waterford) said he would like to ask Mr. Pratt very definitely what he meant by his statement that conditions in Ireland were so different from those across the water that comparison was almost impossible. He himself could not see where this difference lay. They had good men in Ireland; they had an active Association; they had the National Gas Council and the British Commercial Gas Association with them—all just as across the Channel. Why did the author fear that Irish undertakings were not "strong and virile?" Then about the gas sold by the small undertakings being too dear. He (Mr. Edmonds) said that gas at 8s. per 1,000 cu.ft. should be readily proved to be cheaper than competitive sources of heat.

Col. CARR said he would like to offer one or two words of criticism of the Paper. He ventured to suggest that had Mr. Pratt himself been a gas administrator, his Paper would have been very differently written. He would not have started out with the melancholy picture he had painted, if he had possessed inside knowledge. Mr. Pratt had repeated the old saying that "the outsider sees most of the game," but he (Col. Carr) feared that the author was an outsider who had seen little of the game. Really, in his Paper he had told them what they all knew only too well. That was, that if they did not follow a progressive policy in the matters of selling, advertising, and maintaining contact with their consumers, they would lose their business. This they had all known for the last ten years, and there had been numerous cases, not confined to Ireland, in which small undertakings had not been able to render that service. They had not had proper men in control, they had not had progressive directors, and they had gone to the wall. The output of 140 million cu.ft. that had been lost in Ireland represented the less efficient undertakings, and must not be taken as a criterion of electrical competition.

The Gas Industry's Share.

They were attaching a great deal too much importance to electrical competition. The Gas Industry had a good deal of the lighting, and they had a much larger load that the electricians could not touch. The public really hardly needed convincing. He was speaking now as the representative of a large undertaking—Stretford, near Manchester—which supplied great quantities of gas for industrial purposes. One firm of electrical

manufacturers were taking many millions of cu.ft. a year, because they knew well the advantages of gas in industrial processes. He was selling 35 million feet a year to a margarine works, and over 50 millions to a works for drying and processing asbestos sheets, and so on. These were but examples. Many other large processes would occur to them. Dublin would doubtless become a large industrial city, and he believed that the Gas Company would be fully alive to their opportunities.

On the Threshold of Great Events.

There existed a vast industrial field for gas in numberless different directions, and this field would be gradually occupied. In his own case at Stretford, he was showing a 20% increase at the present moment in his supplies to electrical manufacturers, steel works, and every class of industry. Ireland would have to take gas; it could not do without it. If Ireland wished to build up its own industries, it could not do so unless it used the most modern fuel. He was afraid the public might get a wrong impression from Mr. Pratt's Paper, and he would be sorry if anyone left that meeting with the idea that gas in Ireland was "going under." There were factors other than those the author had mentioned to be considered. Ireland had passed through a period of terrible depression—probably worse than in any other country. Small wonder, then, that some of the inefficient should have gone to the wall. But the Gas Industry in Ireland, in spite of all things, was only on the threshold of the great service it would render the State under the control of the men who would back it up and see it through. The answer to the price question was the adoption of tariffs which would offer advantage to those who made the most use of their service. On the selling side the author was right. They must use every means of publicity, and the best means of publicity was the best service. They all appreciated this. As President of the Institution, he made no excuse for trying to correct what he was afraid might otherwise give a wrong impression to the public. The real fact of the matter was that the Gas Industry was only just beginning to grow.

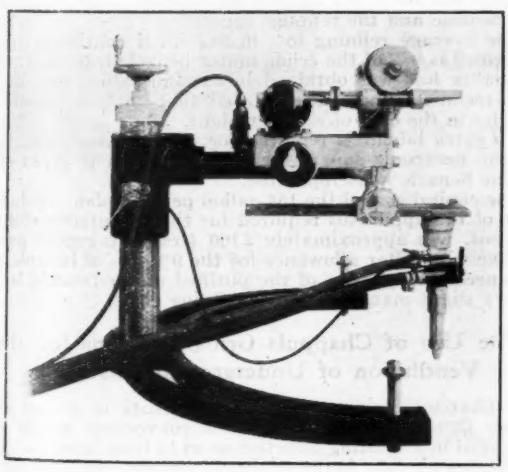
The Author an Optimist.

Mr. PRATT replied that he did not believe the Irish Gas Industry was "going under." It was definitely not so. He had set down in his Paper certain facts, which were, of course, incontrovertible. Whether the 37 works which had closed down were all inefficiently managed, he could not say, but the fact remained that they had gone out of existence, and the influence of gas in those towns was absolutely lost. The only idea he had had in mind was to put forward something seen by an outsider that might be useful. He had visited most of the works during the past twenty years, so that he was fully able to appreciate the difficulties of the small man. Really, he was very much of an optimist, so far as the Irish Gas Industry was concerned. Refrigeration had not been mentioned in the Paper, because he was endeavouring to put forward suggestions applicable to the smaller places. In these small places, making from 10 to 15 million cu.ft. per annum, it was impossible to get such loads, or to secure the huge industrial loads that Col. Carr was to be congratulated upon having obtained at Stretford. Mr. Edmonds had queried difference in conditions between Ireland and England. Well, Ireland had to import coal, whereas in many parts of England it could be obtained cheaply. There was also density of population to be considered. Then linking-up and holding companies did not exist in Ireland. Conditions did vary, and greatly to the disadvantage of Irish gas undertakings. As to the term "strong and virile," he realized that there had been cases of decline for which no one was responsible. In presenting his Paper, he was looking forward to an optimistic future.

Oxy-Coal Gas Cutting and Profiling Machine

The applications of the mechanically driven oxygen cutting burner are daily becoming more and more numerous. Not only is there an increasing demand for the stationary type of machine which cuts shapes from steel plates placed on the bed of the machines, but, due to the ease in which the machines may be moved to any desired position, the portable types for straight line or circle cutting are also increasing in popularity.

The range of profiling machines manufactured by Messrs. Hancock & Co. (Engineers), Ltd., of Croydon, which include the U-arm, Simplex, and Longitudinal series, is already well-known and characterized by the ease and rapidity in which they can be adapted for all classes of cutting.



Improvements from time to time are incorporated, and one recently introduced is the new Universal Tracer Head which operates from a drawing or blue print, and a wooden template cut to exact size, or a strip aluminium template, enables the machine to cut automatically circles and straight lines. In place of the series motor and resistance speed control, a constant speed induction motor for A.C., or an interchangeable shunt motor for D.C., is fitted. An infinitely variable gear of extremely simple and robust design permits of any speed from 2 in.-18 in. per minute. The advantage of this method of drive is that as the motor develops full power at all speeds there is no possibility of any speed fluctuations.

By means of a patented system of gearing all back-lash on the hand-guided drive, which operates from the lines of a drawing, can be instantly taken up.

Of the portable type of machine, the "Circaline" is worthy of note. It is mainly for straight line and circle cutting, but can be used to a limited extent for guiding by hand over a line marked on the plate. One feature is that very small circles can be cut without any overhanging. With this machine a circle 9 in. in diameter can be cut with the entire machine supported within the circle. The machine also incorporates the constant speed motor and infinitely variable gear giving a speed range from 3 in.-27 in. per minute.

A portable machine of more recent introduction is known as the Flange Cutting Machine. This machine is for cutting circles up to a limited size and covers the range of sizes which are normally considered too small for the "Circaline" machine.

The accompanying illustration shows one of these machines with motor drive, although hand operation can be supplied if required.

Standard flange cutting machines have capacities from ½ in. diameter up to 12 in., 15 in., and 18 in., respectively, although a special machine of this type has already been constructed to cut up to 24 in. diameter and to operate over curved as well as flat plates.

The operation of the machine will be understood by reference to the illustration. The motor or handwheel causes the large flat disc to rotate at varying speeds according to the position of the friction disc which drives it. The position of this disc can be set anywhere along the shaft according to the diameter of circle being cut. The burner is mounted on a graduated slide plate so that the exact radius can be quickly set. Movement of the slide plate is effected by means of a handle which operates through a rack and pinion. After the radius is set an adjustable stop is fixed so that the burner can be run out to the radius at the commencement of the cut, a feature which will be readily appreciated.

The burner, which is of the remote control type, is mounted on a ball-bearing swivel so that fouling of the gas tubes is impossible.

Altogether the machine is a simple, robust, and most useful tool for the rapid cutting out of discs or flanges. The cut is a finished one for most purposes.

In addition to oxy-coal gas cutting machines, Messrs. Hancock have supplied oxy-coal gas hand-cutting burners for many years, and their more recently produced "P" type hand cutter has been developed in association with the Research Departments of several gas undertakings.

This oxy-coal gas cutter is used not only for clean plate but also quite extensively in scrap-yards, and is notable for its quick starting, its unchokable jet, and freedom from backfire. It operates direct from the ordinary town gas supply.

French Gas Industry

Review of the 58th Congress of the Union Syndicale de l'Industrie Technique du Gaz en France

(*Continued from p.* 371.)

Recovery of Dehydrated Tar from Gas.

The separation of tar, by means of direct water washing, from gas produced in complete gasification plant offers disadvantages since the water becomes polluted with tar acids and pyridine and cannot be discharged into rivers. On the other hand, if cooling towers are employed with a view to enabling the water to be used in a closed circuit, the vapours rising from the cooling tower are charged with droplets of polluted water and vegetation over a considerable area around the plant suffers.

Ch. Ab der Halden overcomes the difficulty of cooling the gas and freeing it from tar by bringing the gas in contact with a tar solvent or even with tar itself in a bubble cap tower at a suitable temperature. The tar or oil used as a scrubbing medium is contained in a boiler and is continuously circulated between the boiler and the tower by means of a pump. Depending on the temperature of the gas to be treated, the contents of the boiler are either heated with indirect steam or cooled with water. The volume of the circulating liquid increases in amount equivalent to the quantity of tar removed from the gas, hence an amount corresponding to this latter quantity may be removed from the boiler in the form of dehydrated tar, either continuously or intermittently. In due course, if oil is originally used as the scrubbing medium, the circulating liquid will become completely replaced by tar.

The water vapour and light oils remaining in the gas which leaves the scrubber at a temperature of 140° C. are condensed from the gas in a tubular cooler followed by a tar extractor. The liquid condensates pass to a settling tank, the separated water being decanted periodically.

In the case of producer tar, the tar withdrawn from the boiler is too viscous for the requirements of the French road tar specifications, hence the recovered tar must be diluted by the return of the light oils, together with some additional oils, to the boiler.

The process can also be applied to the recovery of road tar from hot coke oven gas or coal gas. In that event, the tar recovered is too fluid for road purposes even if none of the light oil condensate is returned to the boiler. This difficulty is overcome by the admission of direct steam to the boiler to effect partial steam distillation of the tar. The issuing steam and tar vapours pass to the tubular cooler by way of a pipe connecting the boiler to the gas outlet main of the scrubber.

Improvements in the Cabrier System of Tar Dehydration.

M. Cabrier described a modification of his system of tar dehydration of which an account was presented to the 1930 Congress [" JOURNAL," 1930, 191, 308]. In the new plant, the thermo-syphon principle is retained. The boiler is, however, no longer situated in a waste gas main but is heated with internal steam coils. This results in an increase in treatment capacity from the previous figure of 1½-2 tons of tar per day to 3-4 tons per day. Thermostatic control of the valve admitting tar from the feed tank to the boiler enables the throughput to be still further increased to 7-8 tons per day. An adjustable float has been fitted in the feed tank and the pipe leading from the feed tank to the boiler contains a non-return valve in addition to the thermostatically controlled valve. The latter is of the butterfly type and is operated by the agency of a thermostat lying in the dehydrated tar in the vapour separator. A by-pass, with valve, runs from the feed tank direct to the boiler.

Tar containing 2-4% of liquor is treated at a temperature of 120° C. The dehydrated tar contains 0·35% of liquor on an average, the fluctuations being from 0·15 to 0·7%, though nine out of every ten analyses show liquor contents between 0·2 and 0·5%.

A New Process for the Refining of Benzole.

At Dunkirk, where the daily make of gas ranges between 500,000 and 900,000 cu.ft. per day, difficulty is experienced in the sale of crude motor benzole though refined motor benzole can readily be sold direct to consumers at an enhanced price. It was, therefore, decided to refine the motor benzole fraction which is recovered from the benzolized wash oil in a continuous benzole still.

A process of refining which minimizes the loss of the unsaturated hydrocarbons was sought and a process developed by the Société Éréal, a research subsidiary of the Gas Company, and covered by French patents 382335-7 was installed. The process is described by M. Trystram and reduces the actual plus potential gum content of the motor benzole to the figure of 10 mgm. per 100 c.c. laid down by the Unibenzols specification.

The refining agent consists of naphthalene sulphonic acid, 5 lb. of the acid diluted to 1 gallon with methyl alcohol being used per 100 gallons of crude motor benzole. The methyl alcohol serves merely as a solvent for the acid which is a solid and it passes into the refined motor benzole though its amount is but small relatively to that of the benzole.

After laboratory and semi-large scale trials, a plant designed for the treatment of 154 gallons of crude motor benzole per day was erected though the quantity available for treatment is only 56 gallons per day. The process consists in refluxing the benzole with the refining agent for at least 3 hours at 85° C. It is carried out continuously in a 28-gallon lead-lined reaction tank from which the refined product flows continuously into a 20-gallon still. The reaction tank is steam heated and is provided with a reflux condenser. The still vapours are passed to a caustic soda scrubber, condensed, separated from water, and allowed to flow to the motor benzole storage tanks.

Reagent is charged to the reaction tank every 8 hours and about 1 quart of 6% caustic soda solution is introduced into the scrubbing tower once daily. Gums are withdrawn from the reaction tank and still twice daily.

The reagent is prepared in 20-gallon batches from 64 lb. of powdered naphthalene, 118 lb. of concentrated sulphuric acid, and 9·6 gallons of methyl alcohol. The acid and naphthalene are heated in a gas-fired enamelled pot for 3 hours at 150-170° C. with mechanical agitation. The product is then allowed to cool and is dissolved in the methyl alcohol. The volume of gas consumed in the manufacture of a batch of reagent is 140 cu.ft. At the temperature at which the naphthalene is sulphonated, the beta acid is formed to the extent of about 85%. This is of importance since the fact that the beta acid is somewhat soluble in benzole has the effect of creating intimate contact between the benzole and the refining agent.

The average refining loss in the small continuous plant described is 9% of the crude motor benzole fraction though a smaller loss was obtained in the laboratory and in the semi-technical unit. It is stated that the loss should be smaller in the case of a larger plant.

No extra labour is required for the Dunkirk plant since all the necessary supervision and attention is given to it by the benzole house operator.

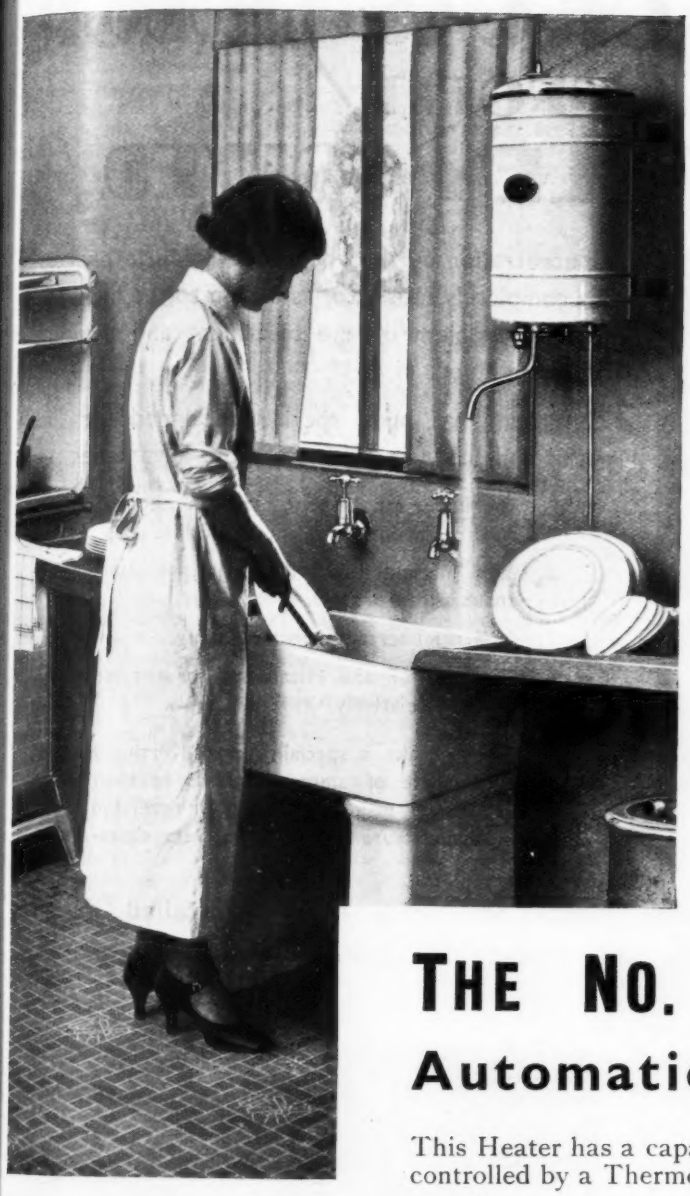
The capital cost of the 154-gallon per day plant, including that of the apparatus required for the manufacture of the reagent, was approximately £160 (francs taken at par of exchange). After allowance for the 9% loss of benzole, the enhanced selling price of the purified motor benzole leaves a very slight margin over the refining costs.

The Use of Chappuis Grids at Lyons for the Ventilation of Underground Chambers.

A Chappuis grid or wind trap consists of a cast steel frame fitted with bars having a convergent profile and arranged in a slanting direction so as to form louvres. This facilitates air flow between the bars under the influence of the vertical component of the wind. The normal depth of the bars is ¾ in.

According to R. Gros, the construction is not strong enough to enable the grids to stand heavy traffic without distortion. A heavier type of grid has therefore been designed and is extensively used by the Lyons Gas Company. It is made up of prismatic bars of cast steel having a depth of 1⅝ in. and strengthened by means of a central bar of the same depth running across the middle of the bars. The whole forms a single casting, complete with frame. The new grid stands up to the heaviest road vehicles.

Particulars of the installation of the grids for the ventilation of the underground chambers containing distribution valves or feeder main governors are given. In order that rain may be prevented from falling into the underground



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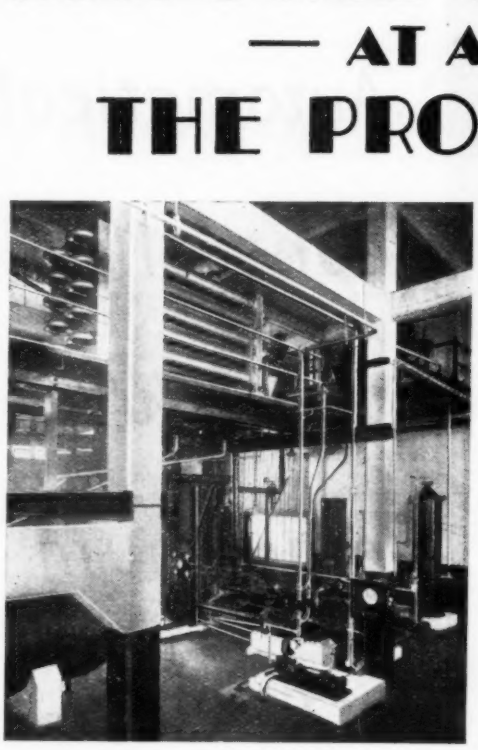

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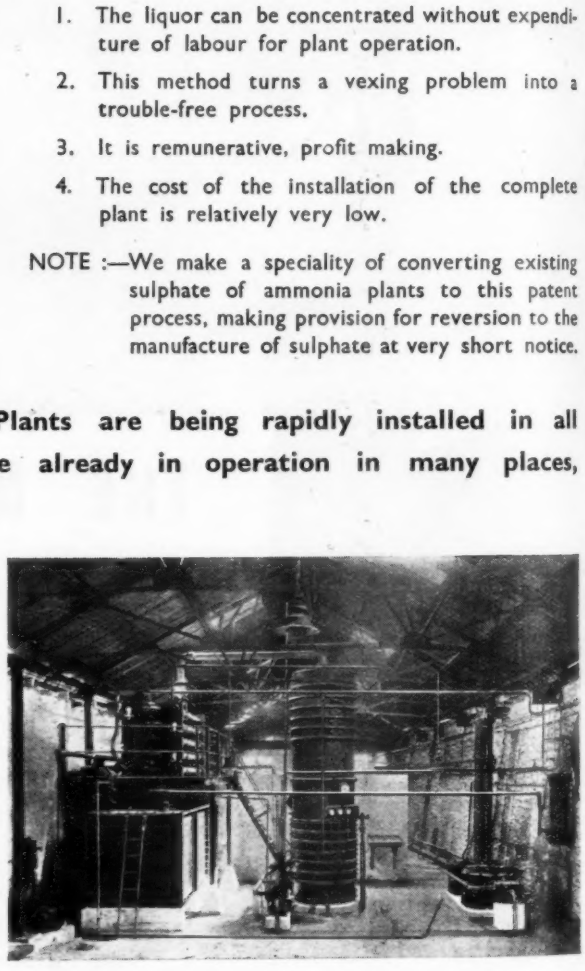

Thorncliffe-Baldurie Plant at Devonport—
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chambers, the grids are never placed immediately over the chambers but are fixed at their sides, a short inclined flue connecting the grid box and the chamber. Two grids, arranged so that the louvres face in opposite directions, are fitted to each underground chamber, one at each end of a diagonal. The base of the grid box is made as permeable as possible to water by use of gravel, sand and pebbles, so that rain water may drain away. In each grid box is a perforated basket which serves to trap road detritus and which is emptied whenever the valves and governors are visited. To prevent dislodgment due to any untoward occurrence, the grids are anchored to the underground chamber by means of hooks.

A louvre system has also been extensively applied at Lyons to the ventilation of cabins situated above ground level and containing accessories of the distribution system such as feeder main boosters, district governors, &c. The louvres, which are arranged vertically, are connected to a movable rod which enables them to be opened or closed to any desired extent. The design is such that the louvres overlap when closed, the cabin then being hermetically sealed. The louvres on two opposite sides of the cabins are arranged so that they open in opposite directions. They are always kept closed in winter during which period naphthalene blockages would be liable to occur if the cabins were allowed to become too cold.

During this season, the cabins may require to be well insulated or even to be artificially heated.

The Evolution of Carbon Monoxide from Coal and Coke.

A knowledge of the course of evolution of carbon monoxide from coal and coke is of special importance in France in view of the fact that the carbon monoxide content of town gas is limited to 15%.

A study of the effect of heating coal and coke to temperatures up to 1,300° C., with special reference to the evolution of hydrogen and carbon monoxide, has been carried out at Gennevilliers and the results of the investigation were described by M. Duchemin. The carbon monoxide content of straight coal gas depends not only on the oxygen content of the coal but also on the heating schedule. The gas evolved when coke is maintained at a temperature of 900° C. contains a higher proportion of carbon monoxide than does the gas obtained during the carbonization of the coal from which the coke is prepared. Moreover, successive increments of the coke gas are successively richer in carbon monoxide.

When coke, prepared at 900° C., is heated in 100° stages to 1,300° C., the gas from successive stages becomes progressively richer in carbon monoxide and poorer in hydrogen. It is of interest that 90% of the therms recoverable by carbonization at 1,300° C. are recovered by carbonization at as low a temperature as 900° C.

When laboratory cokes are compared with large scale cokes, it is found that laboratory-made coke yields, under the influence of heat, a gas containing 10-20% of carbon monoxide, the proportion depending on the nature of the coal. Gas-works coke, however, under the same conditions yields a gas containing 30-50% of carbon monoxide. It is suggested that, under the slow heating conditions of gas-works carbonization, decomposition of the hydrogenated constituents of the coal occurs to a greater extent than decomposition of the oxygenated compounds, hence the coke is comparatively rich in oxygen and, on being further heated, gives a gas rich in carbon monoxide. On the other hand, if the coal is rapidly heated to the carbonizing temperature, as is the case in laboratory experiments, the oxygenated compounds decompose more quickly and the coke then yields a gas comparatively poor in carbon monoxide.

Investigation of Heating Appliances.

C. Deschamps discussed the influence of chimney pull on the efficiency of heating appliances. Different types of appliances may be compared by a determination of their efficiency when coupled up to standard flues, one giving a strong pull—*e.g.*, 1 in. W.G., and one a weak pull—*e.g.*, ¼ in. W.G. This method is, however, not ideal. The author proposes that the performance of a heating appliance should be evaluated for different static pulls at the flue pipe of the appliance. It is then possible to deduce, graphically, the performance of the appliance when connected to a flue of given length, cross-section, and heat transmitting power.

The Swelling Characteristics of Gas Coals.

L. Bro of the Société Lebon et Cie. referred to the fact that French coals often give rise to stronger swelling than do English coals. This causes trouble, particularly in the case of a small works, when a high output of gas is required. A new apparatus for the study of the swelling of coals has been devised and is described in the paper which gives, also, an account of the various factors which affect the degree of swelling of a coal. Among these are the chemical and petrographical composition of the coal, the grading, the bulk density, the moisture content, the degree of weathering, and the rate of heating.

The Reversible Thermal Expansion of Refractory Materials.

The reversible thermal expansion of refractory materials was discussed by M. Charlet with special reference to the expansion of carbonizing plants during the periods of heating up and letting down. The importance of the provision of adequate expansion cavities is emphasized and reference is also made to the need for special attention to the joint between two courses of materials having different expansion characteristics—*e.g.*, firebricks and silica bricks.

During scurfing, temperatures should be maintained within the range in which the thermal expansion curve of the bricks is flat.

The Damping of Station Governors.

P. Dive drew attention to the oscillations which occur in station governors when large demands are suddenly made on the distribution system. These oscillations become transmitted to all consumers' premises but can be minimized if the oscillation of the governor is suitably damped. The ideal solution is a damping system which automatically adjusts itself to the rate of gas emission from the works since, for each rate of gas flow, there is a critical damping value at which the oscillations become damped most quickly. In the study of the question, the governor and the distribution system must be considered as a whole since the periodicity of the oscillations depends on the size of the distribution system. The governor should therefore be suitably designed for the distribution system in connection with which it is to be used.

Reports of Committees.

Distribution.—The Report presents Part I of a very informative Manual of Gas Supply to Premises, a document of 133 pages. The subjects discussed include all interior pipe-work and fittings apart from consumers' meters and the actual appliances themselves. Sections are also devoted to flues and bafflers while useful information on the properties and relative merits of the various types of metal and coated pipes available for carcassing purposes is also given. The Manual covers the needs of both small and large premises, including blocks of flats.

Tar, Benzole, and By-Products.—The whole Report is devoted to a summary of existing knowledge on the subject of ammonia liquor and effluents. The reports of the Ammonia and Liquor Effluents Committee of The Institution of Gas Engineers have been freely drawn upon and the question of dephenolization is also considered.

Gas Education.—An announcement is made that a Technical Handbook of the Gas Industry is to be published towards the end of the year. Arrangements are also being made for the publication of a series of leaflets on the lines of "A Thousand-and-One Uses for Gas."

Manufacture.—The Report presents a skeleton specification and tender for the order or supply of carbonizing and ancillary plant. The various aspects have been covered in great detail though it is recognized that all the sections will not be needed in connection with every project.

Propaganda.—Alterations in the regulations for the stamping of appliances are detailed.

Messrs. Glachant and Fougeray of the Paris Gas Company were awarded a prize of 5,000 francs for burners not liable to strike back.

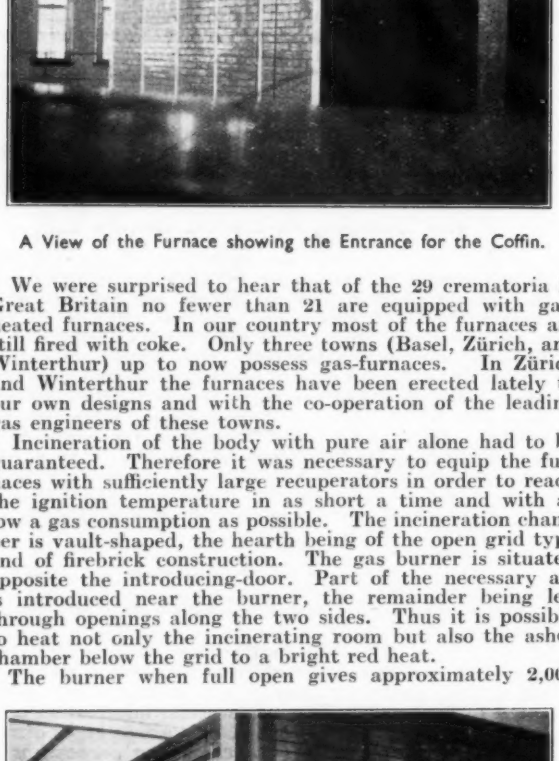
A prize of 4,000 francs was awarded to Etablissements Theobald for pilot burners with a safety device which prevents the main gas supply from being turned on unless the pilot flame is actually alight.

M. Thill received a prize of 2,000 francs to encourage him in further work in respect of a thermostat and various safety devices invented by him. In the case of the safety devices, the deformation of a bimetallic strip serves to keep the main gas valve open as long as the pilot burner remains alight. In the case of the thermostat, a bimetallic strip controls the rate of gas supply in relation to the temperature of the water in a storage water heater.

The C.I.P.A.X. storage water heater of the Compagnie Industrielle pour l'Application du Gaz and the Société Sopromo's system of welding with a mixture of coal gas and acetylene received honourable mention. In the Sopromo system, a mixture of equal volumes of town gas and acetylene is compressed to a gauge pressure of 5 lb. per sq.in. and is employed instead of pure acetylene. The mixture offers a number of advantages over acetylene.

Gas-Fired Crematoria IN Switzerland

Messrs. E. Emch & Co., of Winterthur, who were most interested in the Paper on the Technique of Cremation by Mr. G. le B. Diamond and Mr. T. V. Garrud in the "JOURNAL" for July 10 last, have sent us the following account of the gas-fired furnaces at the Winterthur and Zürich crematoria.

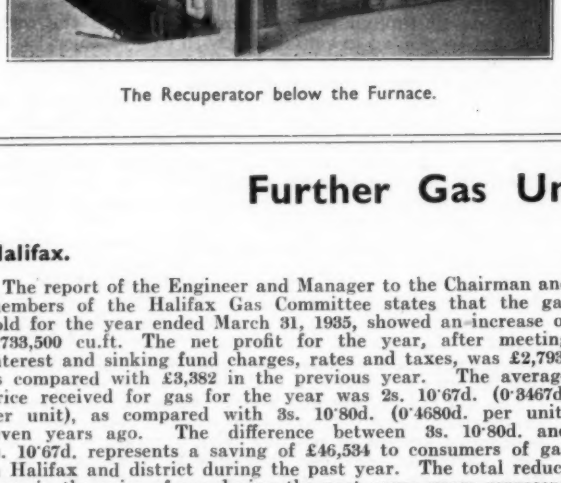


A View of the Furnace showing the Entrance for the Coffin.

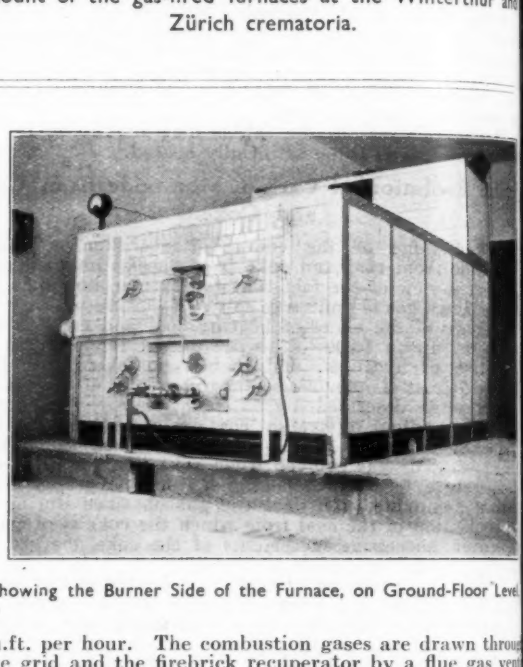
We were surprised to hear that of the 29 crematoria in Great Britain no fewer than 21 are equipped with gas-heated furnaces. In our country most of the furnaces are still fired with coke. Only three towns (Basel, Zürich, and Winterthur) up to now possess gas-furnaces. In Zürich and Winterthur the furnaces have been erected lately to our own designs and with the co-operation of the leading gas engineers of these towns.

Incineration of the body with pure air alone had to be guaranteed. Therefore it was necessary to equip the furnaces with sufficiently large recuperators in order to reach the ignition temperature in as short a time and with as low a gas consumption as possible. The incineration chamber is vault-shaped, the hearth being of the open grid type and of firebrick construction. The gas burner is situated opposite the introducing-door. Part of the necessary air is introduced near the burner, the remainder being led through openings along the two sides. Thus it is possible to heat not only the incinerating room but also the ashes chamber below the grid to a bright red heat.

The burner when full open gives approximately 2,000



The Recuperator below the Furnace.



Showing the Burner Side of the Furnace, on Ground-Floor Level.

cu.ft. per hour. The combustion gases are drawn through the grid and the firebrick recuperator by a flue gas ventilator. The high temperature of both the incinerating room and the ashes chamber (about 700° C.) eliminates smoking of the chimney and allows the ashes to glow thoroughly.

The gas consumed per incineration depends essentially on the frequency. The average time is 70 minutes. In the following table are summarized the observations made at the Winterthur and Zürich crematoria during half a year:

—	Winterthur.									Zürich
Number of weekly incinerations .	5	6	7	8	9	10	11	12	13	4
Average gas consumed, cu.ft. .	2,400	2,200	1,950	1,750	1,650	1,500	1,350	1,250	1,100	25

Further Gas Undertakings' Results

Halifax.

The report of the Engineer and Manager to the Chairman and members of the Halifax Gas Committee states that the gas sold for the year ended March 31, 1935, showed an increase of 2,733,500 cu.ft. The net profit for the year, after meeting interest and sinking fund charges, rates and taxes, was £2,793, as compared with £3,382 in the previous year. The average price received for gas for the year was 2s. 10·67d. (0·3467d. per unit), as compared with 3s. 10·80d. (0·4680d. per unit) seven years ago. The difference between 3s. 10·80d. and 2s. 10·67d. represents a saving of £46,534 to consumers of gas in Halifax and district during the past year. The total reductions in the price of gas during the past seven years represent a saving of £240,194. There have been some small savings during the year, and coal cost £1,430 less. Repairs and maintenance of works plant and machinery cost £1,595 less. This follows upon a decrease of £1,656 in the previous year. There was a saving of £594 in the cost of distribution of gas. The Committee have rigidly followed the policy of providing for replacements, renewals, and extensions of Works and mains out of revenue; and all consumers' gas appliances fixed, and the cost of all materials and labour required for the fixing of these appliances has been met out of revenue. This business has grown enormously. Twenty years ago there were 6,000 appliances in use. At March 31 last there were 68,551. The large proportion of these appliances have been fixed for cash or right or on hire-purchase terms. The profits placed to the credit of the appropriation account from year to year are occasionally allocated to other than Gas-Works purposes. During the years 1926-7-8 the sum of £19,565 was transferred from this account to the relief of borough rates. Last year the appropriation account had to provide for the excavations and the foundations for the new gasholder and other plant of a capital nature, and, in the previous year, all the work of dismantling old plant and preparing the Works for the introduction of new

plant and machinery was placed to the debit of this account. The price of coal is still high, and the receipts from residual products relatively low. But worse than all are the high "overheads." Out of the 2s. 10·67d. received for gas last year, 1s. 0·47d. was required to meet interest, sinking fund, rates, and taxes. These high "overheads" are being rapidly reduced by contributions year by year to the redemption of debt through the sinking fund. At the present rate of progress, the whole of the original debt on the Halifax Gas Undertaking will be paid off in eleven years' time.

Littleborough.

The statement of accounts of the Littleborough Gas Company showed that the receipts for the sale of gas during the year ended June 30, 1935, amounted to £7,447, as compared with £7,870 for the corresponding period of last year. There was a revenue profit of £1,220, compared with £1,257, and the balance available for dividend was £1,173, against £1,308. Payment of the usual dividend was sanctioned.

Malton.

The Directors of the Malton Gas Company, in presenting the statement of accounts for the half-year ended June 30, 1935, report that the balance of profit is £1,766 compared with £2.039 for the corresponding period twelve months ago, but the difference is more than accounted for by extraordinary repairs costing £330 which has been incurred during the period under review. The receipts from gas are practically the same—£6,149 against £6,155. Fittings show a substantial increase, chiefly due to the installation of gas for all purposes in the Council Houses. The statement of accounts shows that after paying income-tax, there is a disposable balance of £7,503, out of which the Directors recommend the payment of a dividend of 6½% free of tax for the half-year. This will absorb £1,560, and leave the sum of £5,943 to be carried to the next account, which is £114 more than a year ago.

Morpeth.

The Directors' report and balance-sheet for the Morpeth Gas Light Company for the year ended June 30, 1935, states that the gross profit amounts to £3,211, which, with £1,121 brought forward from last year, gives a total £4,332 available. The Directors recommend the payment of 6% for the year on preference shares (£841), 6% for the year on ordinary shares (£1,017), both less tax, and the carrying forward of a balance of undivided profits amounting to £1,474. A sum of £1,918 has been spent in repairs and renewals during the year. The balance at revenue account is practically the same as last year; while gas sales are slightly lower the return from residuals is higher. Extension of the Company's mains has been made during the year on Mitford Road and also on the South Road for the Loansdean Building Estate. During the year the Company has suffered a great loss in the death of its Chairman, Mr. Ralph Crawford. The Directors unanimously elected Mr. J. B. Annett to fill the vacancy on the Board.

Perth.

The report of the Perth Gas Committee states that in spite of a slight decrease in domestic and trade sales the Department had had a successful year. The accounts showed an increased surplus of £2,223 over an estimated credit balance of £1,197, which gave a total credit balance to be carried forward of £3,420. With a surplus of £4,330 at the beginning of the year and an estimated revenue of £35,827, *plus* £700 interest on investments, it was anticipated there would be a surplus at the end of the year, after meeting all expenditure, of £1,133.

Salford.

The report of the Light, Heat, and Power Committee on the Salford Gas Undertaking for the year ended March 31, 1935, states that the gross income for the year amounted to £338,864, gross expenditure to £265,008, showing a gross profit of £73,856. Against the gross profit, the following charges fall to be met: Loan charges (interest and sinking fund) £83,460, renewals £19,430, and contributions to general rate fund £12,090, making a total of £114,980, from which must be deducted a Government grant of £109, making a net total charge to be met of £114,871. There is therefore a net debit balance of £41,015 on the year's trading. In comparison with the previous year, sales of gas show a decrease of 8·85%. In bringing the dates of meter reading level with the termination of the financial year, however, only 352 days' gas sales through ordinary meters have been taken into credit for the year, so that to this extent the decrease in sales has been exaggerated. A reduction was made in the price of gas as from Jan. 1, 1935, and this has reduced the year's income by some £3,700. Residual products have produced a revenue equal to 48·71% of the cost of coal used, against 47·23% in the year previous. Renewals have cost less than in the previous year by £10,000, due in part to the closing of a holder renewal suspense account in 1934, and in part to the exercise of every economy in expenditure, consistent with the due upkeep of the works and plant. Although the year's financial results are not, on first sight, encouraging, the Committee feel that the ground has been cleared in readiness for a general improvement, and, provided the reductions in price have the desired result in improving the sales of gas, they can face the future with confidence. Some 7 miles of mains have been laid during the year, bringing the total length to over 384 miles, and the number of all-enamel cookers supplied on simple hire, since their introduction on these terms on January, 1935, reached a figure of over 500.

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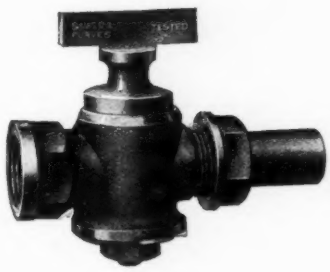

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The last addition to the series of reprints, in booklet form, of the articles contributed monthly to the

"GAS SALESMAN"

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Gas Markets and Manufactures

Stock Market Report

(For Stock and Share List, see later page)

The Stock Exchange opened last week with a continuance of the former active conditions, but later some reaction occurred and the volume of business was considerably reduced. It was inevitable after the large increase in prices during the past few weeks that some readjustment of values would be necessary sooner or later and this was brought about when a substantial profit-taking movement set in during the latter part of the week. Gilt-edged stocks were the chief sufferers, though these rallied towards the close, but the increased activity came too late for prices to make a complete recovery. With few exceptions such as cable and textile shares the Industrial market was similarly affected. In contrast to the general conditions, business in the Gas market was heavier than the previous week, though to some extent this may be attributable to the fact that at the commencement of the week the majority of ordinary and preference stocks were marked *ex* dividend and intending sellers having taken the dividend placed their holdings on the market. As the week progressed, however, prices began to harden again, and in the case of the South Metropolitan ordinary the quotation closed 4½ points higher at 133½, while several other stocks had fully recovered. Other than these the only two changes were increases of 1 point each in Gas Light 4½% debenture to 114½ and Imperial Continental 3½% debenture to 93½.

News from Australia indicates that the Metropolitan Gas Company of Melbourne has had another successful year. The net profits to June 30 last were £221,988, against £209,682, and the Directors have recommended a final dividend of 6s. 6d. per share (again making 13% for the year); £50,000 has been transferred to reserve, leaving £70,623 to be carried forward. The ordinary shares are not quoted in London, but the Company's 5½% debentures, redeemable at par on Oct. 1, 1943, are in the List and now stand at 102½.

Current Sales of Gas Products

The London Market for Tar Products.

Aug. 19.

There is no change to report in the prices of Tar Products, which are as follows:

Pitch is 33s. to 34s. per ton f.o.b.

Creosote, about 6d. per gallon.

Refined tar, 4d. per gallon in bulk at makers' works.

Pure toluole, 2s. 2d. to 2s. 3d.; pure benzole, 1s. 7d. to 1s. 8d.; 95/160 solvent naphtha, 1s. 5d.; and 90/160 pyridine, about 4s. 6d. to 4s. 9d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

Aug. 19.

The average prices of gas-works products during the week were: Gas-works tar, 18s. to 23s. Pitch—East Coast, 31s. to 33s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 31s. to 33s.* Toluole, naked, North, 1s. 8d. to 1s. 9d. Coal-tar crude naphtha, in bulk, North, 6¾d. to 7d. Solvent naphtha, naked, North, 1s. 5d. to 1s. 5½d. Heavy naphtha, North, 9½d. to 10½d. Creosote, *ex* works, in bulk, North, liquid and salty, 5½d. to 5¾d.; low gravity, 5d. to 5⅝d.: Scotland, 5d. to 5⅝d. Heavy oils, in bulk, North, 5d. to 5¼d. Carbolic acid, 60's, 1s. 11d. to 2s. Naphthalene, £10 to £11. Salts, 60s. to 75s., bags included. Anthracene, "A" quality, 2½d. to 3d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *Aug.* 17.

Market is decidedly quiet, but price changes are few.

Crude gas-works tar.—The actual value is 28s. to 30s. per ton *ex* works in bulk.

Pitch is a dull feature with export value still called 32s. 6d. per ton f.o.b. Glasgow, while, in the home market, practically no business is being conducted at 32s. 6d. per ton *ex* works in bulk.

Refined tar is moving in reasonable quantities at 2¾d. to 3d. per gallon *ex* works in buyers' packages.

Creosote oil continues firm with supplies on the short side. B.E.S.A. Specification, 5⅛d. to 5⅜d. per gallon; low gravity, 5¼d. to 5½d. per gallon; and neutral oil, 5¼d. to 5½d. per gallon; all f.o.r in bulk.

Cresylic acid shows no material alteration, although, if anything, there has been more enquiry. Pale, 97/99%, 1s. 1½d. to 1s. 2½d. per gallon; dark, 97/99%, 1s. to 1s. 0½d. per gallon; and pale, 99/100%, 1s. 2½d. to 1s. 3½d. per gallon; all *ex* works naked.

Crude naphtha is valued at 4½d. to 5d. per gallon f.o.r., according to quality and district.

Solvent naphtha.—90/160 grade is 1s. 3½d. to 1s. 4d. per gallon, and 90/190 heavy naphtha is 10½d. to 11½d. per gallon.

Motor benzole is now difficult to secure in this district and value is therefore steady at 1s. 3½d. to 1s. 4d. per gallon in bulk at makers' works.

Pyridines.—90/160 grade is 5s. 6d. to 6s. per gallon, and 90/140 grade, 6s. to 6s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole . . .	0	9½	to	0	10	per gallon at works
Motor ,, . . .	1	3	,,	1	3½	,, ,, ,,
90% ,, . . .	1	4	,,	1	4½	,, ,, ,,
Pure ,, . . .	1	7½	,,	1	8	,, ,, ,,

Contracts Advertised To-Day

Pipes and Specials.

Penrith Gas Department. [p. 431.]

Trade Notes

"Sankey" Down Draught Preventing Pot.

We have received from Messrs. J. H. Sankey & Son, Ltd., Ilford, Essex, a copy of their new catalogue dealing with the "Sankey" down-draught preventing pot. The publishers will be only too glad to forward a copy to any of our readers who may be interested in the subject.

"Copper Data."

The latest addition to the Engineers' Note-Book series published by the Copper Development Association, Thames House, Millbank, S.W. 1, is "Copper Data," in which the Association have succeeded in collecting all the generalized information about copper which the ordinary user is likely to need. This book, smartly finished in embossed copper, will be sent free of charge to any of our readers who are interested in the subject.

A Handy Temperature Chart.

We have received from Messrs. Hadfields, Ltd., East Hecla Works, Sheffield, a copy of a temperature chart, prepared by their Research Department, showing the wide range of industrial temperatures for which the various steels supplied by them are suitable. The chart, which covers a temperature range from absolute zero to as high as 1,300° C., shows in a clear and graphic manner how the problem of the efforts of temperature in industry, and how to legislate for them by the use of suitable constructional materials, is met by the use of a varied range of alloys.

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STOCK AND SHARE LIST

Official Quotations on the London and Provincial Stock Exchanges

Issue. £	Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, Aug. 16.	Rise or Fall on Week.	Transactions, Lowest and Highest Prices During the Week.
1,551,868	Stk.	Mar. 11	7	7	Alliance & Dublin Ord. ...	132—142	...	...
374,000	,,	June 24	4	4	Do. 4 p.c. Deb. ...	90—100	...	...
557,655	,,	Aug. 12	7	7	Barnet Ord. 7 p.c. ...	162—167*	—3	98⅞—99½
300,000	1	Apl. 8	1/4⅛	1/9⅜	Bombay, Ltd.	1 7/16—1 11/16	...	...
178,480	Stk.	Aug. 12	9⅛	9⅛	Bournemouth sliding scale ...	222—232*	—3	32/—32/4½
550,050	,,	,,	7	7	Do. 7 p.c. max. ...	168—173*	...	...
489,160	,,	,,	6	6	Do. 6 p.c. Pref. ...	147—152*	—2	169—171
50,000	,,	June 24	3	3	Do. 3 p.c. Deb. ...	85—90	...	152
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	106—111	...	...
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	123—128	...	109—111
357,900	,,	Aug. 12	7½	7½	Brighton, &c., 6 p.c. Con. ...	170—175*	—3	...
649,955	,,	,,	6½	6½	Do. 5 p.c. Con. ...	150—155*	—3	...
205,500	,,	,,	6	6	Do. 6 p.c. B. Pref.	142—147*	—3	...
1,487,500	,,	July 8	5	5	Bristol, 5 p.c. max.	120—123a	...	...
120,420	,,	June 7	4	4	Do. 1st 4 p.c. Deb. ...	102—104a	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	101—103a	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	127—130a	...	...
855,000	,,	Mar. 11	7	8	British Ord.	154—159	...	156½
100,000	,,	June 7	7	7	Do. 7 p.c. Pref.	160—165	...	...
350,000	,,	,,	5½	5½	Do. 5½ p.c. "B" Cum. Pref.	112—117	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	109—114	...	...
200,000	,,	,,	...	17/6	Do. 3½ p.c. Red. Deb. ...	99—101	...	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1—3	...	...
100,000	10	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1—3	...	...
150,000	Stk.	June 24	4½	4½	Do. 4½ p.c. Deb. ...	83—88	...	...
626,860	,,	July 22	6	6	Cardiff Con. Ord. ...	127—132*	...	...
237,860	,,	June 7	5	5	Do. 5 p.c. Red. Deb.	107—112	...	...
157,150	,,	Aug. 12	6½	5	Chester 5 p.c. Ord.	109—114b*	—2	...
98,936	1	Mar. 25	2/-	2/-	Colombo, Ltd., Ord.	1⅜—1⅝	...	...
24,500	1	,,	1/4⅛	1/4⅛	Do. 7 p.c. Pref. ...	20/6—22/6	...	...
609,204	1	Mar. 25	-/11/48	-/11/48	Colonial Gas Assn. Ltd. Ord.	20/6—22/6	...	...
296,053	1	,,	1/3·30	1/3·30	Do. 8 p.c. Pref.	26/—28/-	...	...
1,775,005	Stk	Aug. 12	6	5	Commercial Ord.	102—107*	—1	102—104½
620,000	,,	June 7	3	3	Do. 3 p.c. Deb. ...	85—90	...	89
286,344	,,	Aug. 12	5	5	Do. 5 p.c. Deb. ...	121—126*	—2	...
807,560	,,	Aug. 12	7	7	Croydon sliding scale... ...	152—157*	—3	153
569,590	,,	,,	5	5	Do. max. div.	113—118*	—2	115—116½
620,385	,,	June 24	5	5	Do. 5 p.c. Deb.	123—128	...	125¼
542,270	,,	Aug. 12	10	7	Derby Con.	180—190c*	—5	...
55,000	,,	June 24	4	4	Do. 4 p.c. Deb.	100—105c	...	...
239,000	,,	Aug. 12	5	5	East Hull Ord. 5 p.c. ...	106—111*	—2	...
181,625	,,	Aug. 12	6	6	East Surrey Ord 5 p.c. ...	129—134*	—2	...
175,609	,,	June 7	5	5	Do. 5 p.c. Deb. ...	123—128	...	...
1,002,180	,,	Mar. 11	†	†7	European, Ltd.	170—180	...	170
19,313,481	,,	Aug. 12	5⅜	5⅜	Gas Light & Coke 4 p.c. Ord.	28/—28 6f*	...	27/7½—28/4½
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	88—91*	—1	...
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	107—110*	—2	109—110½
8,602,497	,,	June 7	3	3	Do. 3 p.c. Con. Deb. ...	89—92	...	91—93
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	115—118	...	117
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	113—116	+1	116
270,466	,,	Aug. 12	6	6	Harrogate New Cons. ...	132—137*	—3	...
140,000	1	Mar. 25	1/7½	1/7½	Hongkong & China, Ltd. ...	1½—1⅝	...	27/6
213,200	Stk.	Aug. 12	6	6	Hornsey Con. 3½ p.c....	130—135*	—½	134—134½
5,600,000	,,	May 13	10	14	Imperial Continental Cap. ...	215—220	...	215½—218½
223,130	,,	July 22	3½	3½	Do. 3½ p.c. Red. Debs.	91—96	+1	94½—95½
285,242	,,	Aug. 12	8½	8½	Lea Bridge 5 p.c. Ord. ...	175—180*	—2½	...
2,167,410	,,	Aug. 12	6	6	Liverpool 5 p.c. Ord.... ...	138—140b*	—1½	...
245,500	,,	June 7	5	5	Do. 5 p.c. Red. Pref. ...	105—110b	...	...
306,083	,,	July 8	4	4	Do. 4 p.c. Deb.	103—106b	...	...
165,736	,,	Feb. 18	8	10	Maidstone 5 p.c. Cap. ...	185—195	...	...
63,480	,,	June 24	3	3	Do. 3 p.c. Deb. ...	82—87	...	...
75,000	,,	May 27	†10	†10	Malta & Mediterranean ...	212—222	...	...
392,000	—	Apl. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	100—105	...	...
231,978	Stk.	Aug. 12	5	5	M. S. Utility "C" Cons. ...	108—113*	—2	...
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	101—106*	—1	...
360,075	,,	June 24	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
148,955	,,	,,	5	5	Do. 5 p.c. Deb. ...	123—128	...	...
125,000	—	July 1	3½	3½	Do. 3½ p.c. Rd. Rg. Bds.	97—100	...	...
675,000	,,	June 24	†13	†13	Montevideo, Ltd.	48—58	...	...
2,061,315	,,	Aug. 12	5½	5	Newcastle & Gateshead Con.	25/3—26/3df*	—/6	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	106½—107 d*	—1½	...
776,706	,,	June 7	3½	3½	Do. 3½ p.c. Deb. ...	99—101d	...	...
277,285	,,	Oct. 8	5	5	Do. 5 p.c. Deb. '43 ...	105—107d	...	...
274,000	,,	Aug. 12	5	5	Newport (Mon.) 5 p.c. max....	113—118a*	—2	...
225,000	,,	Aug. 12	7½	7½	North Middlesex 6 p.c. Con.	162—172*	—3	...
396,160	,,	Aug. 12	5	5	Northampton 5 p.c. max. ...	105—110*	—2	...
300,000	,,	Apl. 29	†9	†7	Oriental, Ltd.	168—173	...	...
416,617	,,	June 7	8	8	Plym'th & Stonehouse 5 p.c.	162—167	...	...
504,416	,,	Aug 12	8½	8½	Portsm'th Con. Stk. 4 p.c. Std.	170—175*	—3	...
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	108—113*	—2	...
114,000	,,	July 22	5	5	Preston 5 p.c. Pref.	106—111*	...	...
321,961	1	Apl. 8	...	...	Severn Val. Gas Cor. Ld. Ord.	22 —23/-	...	23/—23/1½
319,510	1	Mar. 25	...	...	,, ,, 4½ p.c. Cum. Pref.	22 —23/-	...	22/6
1,736,968	Stk.	Feb. 18	6	6	Sheffield Cons.	141—143e	...	...
95,000	,,	June 24	4	4	Do. 4 p.c. Deb.	102—104e	...	...
133,201	,,	Aug. 12	5	8½	Shrewsbury 5 p.c. Ord. ...	139—144*	—3	...
90,000	10	May 27	‡3	‡3½	South African	3—4	...	...
1,061,779	1	May 13	1/2½	1/2½	South East'n Gas Cn. Ld. Ord.	28/—29/-	...	29/-
845,016	1	Mar. 11	-/10½	-/10½	Do. 4½ p.c. Red. Cum. Pref.	22 6—23 6	...	...
450,000	Stk.	Aug. 12	4	4	Do. 4 p.c. Red. Deb. ...	100—103*	...	...
6,709,895	,,	Aug. 12	6½	5	South Met. Ord.	131—136*	+4½	128—135
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf. ...	147—152*	...	...
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf. ...	107—110*	—2	...
1,895,445	,,	June 24	3	3	Do. 3 p.c. Deb. ...	87—90	...	89½
1,000,000	,,	July 8	5	5	Do. 5 p.c. Red. Deb....	112—117	...	116½
209,820	,,	Aug. 12	8½	8½	South Shields Con.	171—173d*	—3	...
1,543,795	,,	Aug. 12	6	6	South Suburban Ord 5 p.c. ...	128—133*	—2	...
512,825	,,	,,	5	5	Do. 5 p.c. Pref. ...	121—126*	...	...
500,000	,,	,,	4	4	Do. 4 p.c. Pref. ...	105—110*	...	108½
888,587	,,	June 7	5	5	Do. 5 p.c. Deb. ...	123—128	...	125½—126½
250,000	,,	,,	4	4	Do. 4 p.c. Deb. ...	105—110	...	...
647,740	,,	Aug. 12	5	5	Southampt'n Ord. 5 p.c. max.	115—120*	—1	...
121,275	,,	June 7	4	4	Do. 4 p.c. Deb.	100—105	...	102½
350,000	,,	Aug. 12	5½	5½	Swansea 5½ p.c. Red. Pref. ...	113—118*	—2	116
200,000	,,	June 7	6½	6½	Do. 6½ p.c. Red. Deb. ...	98—103	...	101—102
1,076,490	,,	Aug. 12	6½	6½	Tottenham and District Ord.	145—150*	—3	152—154
409,835	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	130—135*	—1	132½—136
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125*	...	...
334,615	,,	June 7	4	4	Do. 4 p.c. Deb. ...	101—106	...	...
369,774	,,	Aug. 12	7	7	Uxbridge, &c., 5 p.c.	148—153*	—2	150—154½
108,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	118—123*	...	...
1,326,700	,,	Aug. 12	7	7	Wandsworth Consolidated ...	155—160*	—2	160
1,371,373	,,	,,	5	5	Do. 5 p.c. Pref. ...	121—126*	...	123½—125
1,317,964	,,	June 7	5	5	Do. 5 p.c. Deb. ...	125—130	...	127—128
338,300	,,	,,	4	4	Do. 4 p.c. Deb. ...	102—107	...	...
158,400	,,	Aug. 12	6g	5	Winchester W.& G. 5 p.c. Con.	114—119*	—2	...

Quotations at :—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *f.*—The quotation is per £1 of Stock. *g.*—Paid £3, including 10s. on account of back dividends. * Ex. div. † Paid free of income-tax. ‡ For year.

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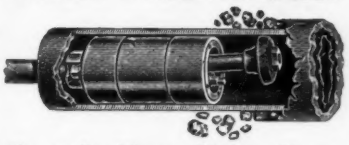

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